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Learning and Labor

University of Illinois

Summer Session, 1918

General Announcements
Faculty and Courses

June 17 to August 9, 1918

(For candidates for masters' degrees, 9 weeks; for courses in physical training and library science, 6 weeks.)

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UNIVERSITY OF ILLINOIS

Administrative Officers, Summer Session

EDMUND JANES JAMES, Ph.D., LL.D., President of the University
KENDRIC CHARLES BABCOCK, Ph.D., LL.D., Dean of the College of Liberal Arts and Sciences
Director of the Summer Session. 304 University Hall
JOHN ALFORD STEVENSON, A.M., Secretary of the School of Education. 203 University Hall
CHARLES MAXWELL MCCONN, A.M., Registrar. 156 Administration Building
LLOYD MOREY, A.B., B.Mus., C.P.A., Acting Comptroller

Calendar

Summer Session, 1918

June 17, Monday	Registration Day
August 8 and 9, Thursday and Friday	Final Examinations

First Semester, 1918-19

September 9 to 13, Monday to Friday	Entrance Examinations
September 16 and 17, Monday and Tuesday	Registration Days
September 18, Wednesday, 8 a.m.	Instruction Begins

Growth in Registration of Students

ALL DEPARTMENTS

'94-'95	810
'99-'00	2225
'04-'05	3734
'09-'10	5118
'14-'15	5956
'15-'16	6427
'16-'17	6828
'17-'18	5590

OFFICERS OF INSTRUCTION

SUMMER SESSION, 1918

KENDRIC CHARLES BABCOCK, Ph.D., LL.D., DIRECTOR

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FREDERICK OSBAND ANDEREGG, Ph.D., *Instructor in Chemistry*
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HERBERT JEWETT BARTON, A.M., *Professor of Latin*
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SILAS ALONZO BRALEY, Ph.D., *Instructor in Chemistry*
WILLIAM EVERETT BRITTON, A.M., J.D., *Instructor in Business Law*
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WERRET WALLACE CHARTERS, Ph.D., *Professor of Education*
EVA CLOUD, *Lecturer*, Librarian of Kewanee Public Library
ISAAC M COCHRAN, *Professor of Public Speaking*, Carleton College
ARTHUR SAMUEL COLBY, M.S., *Instructor in Pomology*
CARL COLVIN, B.S., *Associate in Agricultural College Extension*
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HERBERT KNIGHT DENNIS, A.M., *Assistant in Sociology*
JOHN A DETLEFSEN, D.Sc., *Assistant Professor of Genetics*
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JOHN LAWRENCE ERB, F.A.G.O., *Director of the School of Music*
ERNEST CARROLL FAUST, Ph.D., *Instructor in Zoology*
JOHN DRISCOLL FITZ-GERALD, Ph.D., *Professor of Spanish*
JUSTUS WATSON FOLSOM, D.Sc., *Assistant Professor of Entomology*
HARRY LOVERING GILL, *Associate in Track Athletics*
JOSEPH EUGENE GILLET, Ph.D., *Associate in Comparative Literature and Romance Languages*
ROBERT DOUGLAS GLASGOW, Ph.D., *Instructor in Entomology*
JAMES HENRY GREENE, M.S., *State Leader in Junior Extension*
COLEMAN ROBERTS GRIFFITH, A.B., *Assistant in Psychology*
IRA SAMUEL GRIFFITH, A.B., *Professor of Manual Arts*, University of Missouri
CHARLES FRANCIS HILL, A.M., *Assistant in Physics*
DAVID SPENCE HILL, Ph.D., LL.D., *Acting Professor of Education*
HORACE ADELBERT HOLLISTER, A.M., *Professor of Education*
CHARLES FREDERICK HOTTES, Ph.D., *Professor of Plant Physiology*
LLOYD BRELSFORD HOWELL, A.B., *Assistant in Chemistry*
GEORGE A HUFF, B.S., *Director of Physical Training for Men*
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ARMIN HAJMAN KOLLER, Ph.D., *Instructor in German*
HARRY CLEVELAND KREMERS, Ph.D., *Instructor in Chemistry*
EDWARD JOHN LAKE, B.S., *Assistant Professor of Art*
MADGE LAMOREAUX, *Assistant in Household Science*

William Chauncy Langdon, A.M., *Lecturer on Community Drama, Master of the Pageant*
Lawrence Marcellus Larson, Ph.D., *Professor of History*
Otto Eduard Lessing, Ph.D., *Professor of German*
Howard Bishop Lewis, Ph.D., *Assistant Professor of Physiological Chemistry*
Simon Litman, Dr. Jur. Pub., *Assistant Professor of Economics*
A Charles Littleton, A.B., *Instructor in Accountancy*
Manuel Leon Lopez, A.B., *Assistant in Romance Languages*
Walter Byron McDougall, Ph.D., *Associate in Botany*
Jean McKinnon, A.M., *Instructor in Household Science*
Walter Scott Monroe, Ph.D., *Professor of Education and Director of the Bureau of Educational Measurements*, State Normal School, Emporia, Kansas
Herbert Fisher Moore, M.M.E., *Research Professor of Engineering Materials*
Olin Harris Moore, Ph.D., *Associate in Romance Languages*
Aretas Wilbur Nolan, M.S., *Assistant Professor of Agriculture Extension*
Fred Lewis Pattee, A. M. Litt. D., *Professor of the English Language and Literature*, Pennsylvania State College.
William James Putnam, B.S., *Instructor in Theoretical and Applied Mechanics*
James Garfield Randall, A.M., Ph.D., *Professor of History and Economics*, Roanoke College
Alvis L Rhoton, A.M., *Professor of Pedagogy*, Georgetown College (Kentucky)
Ralph Emerson Rindfusz, A.M., *Assistant in Chemistry*
Christian Alban Ruckmich, Ph.D., *Assistant Professor of Psychology*
Arthur James Schuettner, E.G., *Assistant in Physical Training*
Fred B Seeley, M.S., *Assistant Professor of Theoretical and Applied Mechanics*
James Byrnie Shaw, D.Sc., *Associate Professor of Mathematics*
Clara Mabel Smith, A.B., *Assistant in Education*
William Herschel Smith, M.S., *Associate in Animal Husbandry*
James Garfield Stevens, Ph.D., *Associate in Sociology*
Bird Richard Stevenson, A.M., *Assistant in Physics*
John Alford Stevenson, A.M., *Lecturer in Education and Secretary of the Department of Education*
Robert Stewart, Ph.D., *Associate Professor of Soil Fertility*
Edward Earle Swinney, A.B., B.Mus., *Instructor in Music*
Harley Jones VanCleave, Ph.D., *Associate in Zoology*
Sabra Wilbur Vought, A.B., B.L.S., *Instructor in Library Economy*
Edward Hardenbergh Waldo, A.B., E.E., *Assistant Professor of Electrical Design*
Edward Harvey Walworth, M S., *Instructor in Crop Production*
Floyd Rowe Watson, Ph.D., *Professor of Experimental Physics*
Earl Archibald White, Ph.D., *Assistant Professor of Farm Mechanics*
Robert Calvin Whitford, A.M., *Instructor in English*
Charles Allyn Williams, Ph.D., *Associate in German*
Elmer Howard Williams, Ph.D., *Associate in Physics*
Lewis Ward Williams, Ph.B., *Assistant in Education*
Frank Archibald Wyatt, Ph.D., *Associate in Soil Fertility*
William Wodin Yapp, M.S., *Instructor in Dairy Husbandry*
Robert Carl Zuppke, Ph.B., *Associate in Football*

GENERAL STATEMENT

Location of the University of Illinois

The University of Illinois is situated in Champaign County in the eastern central part of the state between the cities of Urbana and Champaign, and within the corporate limits of the former. It is one hundred and twenty-eight miles south of Chicago, on the main Chicago-New Orleans line of the Illinois Central, the station being Champaign. The Wabash and the Cleveland, Cincinnati, Chicago & St. Louis ("Big Four" of the New York Central Lines) railroads have stations in both cities. The cities of Urbana and Champaign have together a population of 29,000.

The institution was incorporated February 28, 1867, under the name of the Illinois Industrial University. It was not until 1885 that the Legislature changed the name to the University of Illinois.

Buildings and Grounds

The land occupied by the University and its several departments embraces about two hundred thirty-eight acres, besides a farm of about nine hundred ninety acres. The buildings at Urbana are fifty-one in number, chief of which are the Agriculture Building, Agronomy Buildings, Armory, Astronomical Observatory, Auditorium, Beef Cattle Building, Central Heating Station, Chemistry Laboratory, Physics Laboratory, Electrical Engineering Laboratory, Engineering Hall, Lincoln Hall, Farm Mechanics Building, Horticulture Building, Law Building, Library Building, Laboratory of Applied Mechanics, Mechanical Engineering Laboratory, Men's Gymnasium, Metal Shops, Natural History Building, Pumping Station, University Hall, Woman's Building, Wood Shop, Foundry, Commerce Building, Transportation Building, Gymnasium Annex, Stock Pavilion, Administration Building, Vivarium Building, and Ceramics Building. The School of Education Building and the Smith Memorial Music Building are under construction.

Libraries

The University library, at Urbana, contains 390,000 volumes, and subscribes for over 3,400 periodicals; the current numbers of many of these periodicals are kept in the public reading room. The library of the State Laboratory of Natural History contains 8,700 volumes and 44,000 pamphlets.

The library is housed, for the most part, in the library building, and is for the use of the whole University. All students have the direct use of 10,700 volumes in the reading rooms, and in addition graduate and advanced students have the use of the seminar libraries. Twenty-one seminar and departmental collections are maintained in various buildings on the campus, including the six seminars in Lincoln Hall.

The Summer Session

The Summer Session of the University of Illinois for 1918 will open on June 17, and close on August 9, making a term of *eight weeks*, or one-half a semester, for all students except graduate students who are candidates for a master's degree, for whom the prescribed term is *nine* weeks, and except students taking only courses in library science, physical training for men, or athletic coaching, for whom the term is *six* weeks from June 17. The opening day will be devoted to registration. The final examinations will be held on Thursday and Friday of the last week.

All of the courses, except those in library science and physical training for men, will extend through the eight weeks. Students who wish to remain for only six weeks, however, may obtain from the Director of the Summer Session a certificate for such attendance, but university credit will not be given for six-weeks' courses, except for those in physical training for men and in athletic coaching.

The number of semester hours which may be earned in each course is stated in the descriptive outline given later in this announcement. Students may register for courses aggregating eight hours or less.

Purpose

The Summer Session is an organized integral part of the University year. Tho its organization is not subdivided into colleges, numerous courses are offered by departments in the Colleges of Liberal Arts and Sciences, Commerce, Agriculture, Engineering, and in the School of Music and the Library School. All courses may be counted toward an A.B. or B.S. degree, or toward a master's degree, unless otherwise specified. By two Summer Sessions a regular student may reduce the eight semesters to seven, thus securing his degree a half year earlier than he would otherwise have done.

Students who have just graduated from an accredited high school may matriculate in the Summer Session and obtain credit for a half-semester. Pre-medical students are strongly urged to do this and to register for chemistry or zoology, mathematics, rhetoric, or other prescribed pre-medical subjects.

One of the primary purposes of the Summer Session is to meet the needs of the teachers in the public schools who wish to spend a part of the summer vacation in serious study or investigation. Numerous courses are designed particularly for high-school teachers, supervising officers, teachers of special subjects (agriculture, art, household science, manual training, music, etc.), and coaches of athletic teams; graduate courses are offered for college instructors, school supervisors, and principals who are working for advanced degrees.

Admission

Admission in regular status to courses in the Summer Session for which university credit is granted is limited to students who could be regularly admitted into the colleges of the University (Liberal Arts and Sciences, or Commerce, or Engineering, or Agriculture) in which they would be registered in the winter session.

In order to meet in full the entrance requirements for any one of these colleges, a student must be a graduate of an accredited high school (or in lieu of such graduation, must pass entrance examinations in five units, including English composition, 1; algebra, 1; and 3 others to be designated by the University authorities in each case), and must obtain credit, either by passing entrance examinations or by presenting certificates of work completed in accredited secondary schools or other recognized schools, for 15 units of high-school work, or the equivalent, in subjects accepted for admission to the University, including in the case of each college certain subjects especially prescribed for admission to that college.

(1) The subjects prescribed for admission to the *College of Liberal Arts and Sciences*, for the *General Curriculum*, the *Curriculum in Journalism*, and the *Pre-Legal Curriculum*, are: English, 3 units; algebra, 1 unit; plane geometry, 1 unit; laboratory science, 1 unit; Latin, Greek, French, German, or Spanish, 2 units (both units in the same language). Seven elective units are required to make up the total of 15 units.

(2) For the *College of Liberal Arts and Sciences*, for the curriculums in *Household Administration* and for *Household-Science Teachers*, the prescriptions are the same as in paragraph 1, except that the laboratory science, 1 unit, must be physics. (See also paragraph 7.)

(3) For the *College of Liberal Arts and Sciences*, for the *Pre-Medical Curriculum*, the prescribed subjects are: English, 3 units; algebra, 1 unit; plane geometry, 1 unit; laboratory science, 1 unit; Latin, Greek, French or German, 2 units (both units in the same language); history or civics, 1 unit. Six elective units are required to make up the total of 15 units.

(4) For the *College of Liberal Arts and Sciences*, for the curriculums in *Chemistry* and *Chemical Engineering*, the prescribed subjects are: English, 3 units; algebra, 1 unit; plane geometry, 1 unit; laboratory science, 2 units; German or French, 2 units (both units in the same language). Six elective units are required to make up the total of 15 units.

(5) For the *College of Engineering*, the prescribed subjects are: English, 3 units, algebra, 1½ units; plane geometry, 1 unit; solid and spherical geometry, ½ unit; laboratory science, 1 unit. Eight elective units are required to make up the total of 15 units.

(6) For the *College of Agriculture*, for the *agricultural curriculums*, the prescribed subjects are: English, 3 units; algebra, 1 unit; plane geometry, 1 unit; laboratory science, 2 units. Eight elective units are required to make up the total of 15 units.

(7) For the *College of Agriculture*, for the curriculum in *Household Science*, the prescribed subjects are the same as n paragraph 6 except that 1 of the units of laboratory science must be physics.

(8) For the *School of Music*, the prescribed subjects are: English, 3 units; algebra, 1 unit; plane geometry, 1 unit; laboratory science, 1 unit; Latin, Greek, French, German, or Spanish, 2 units (both units in the same language); music, 2 units. Five elective units are required to make up the total of 15 units.

(9) Students who can meet the prescriptions for any of the other colleges as outlined above may be admitted to the *College of Commerce and Business Administration.*

Admission to courses which give university credit, as *special students, not candidates for a degree,* may be granted to persons 21 years of age or over, subject to the general regulations of the University relating to special students.

A student who transfers from another college or university must present a letter of honorable dismissal, and transcript of record, from the institution previously attended.

Registration

Students will present themselves for registration on Monday, June 17. *The registration offices will be in the Library Building.* A representative of each department offering Summer Session courses will be present throughout the day. Students will consult with these representatives regarding the courses for which they wish to register. The study blanks will then be filled out, submitted to the Director for approval, and filed with the Registrar.

Students who wish to register for advanced degrees will first secure their study-lists at the Registrar's office, 156 Administration Building

Fees

All fees are due upon registration.

A tuition fee of twelve dollars ($12) is required of all students in regular attendance at the Session. This entitles one to admission to regular courses and to all special lectures. It also entitles one to one lesson per week of music of collegiate grade. An extra laboratory fee is charged in some courses for materials used. Any single course, counting not more than two and one-half credit hours, may be taken for a fee of six dollars ($6) and the laboratory fee, if there be any in connection with the course taken.

Fees in addition to the tuition fee are required for special work in music, except as just noted. These are comparable with the fees charged for similar work in regular semesters:

Two lessons per week in piano, voice, or in organ of collegiate grade	$12.00
One lesson per week in piano or voice of preparatory grade	5.00
Two lessons per week in piano or voice of preparatory grade	8.00
Use of piano for one hour per day for two months	1.50
Use of organ for one hour per day for two months	10.00
Use of organ for one-half hour per day for two months	5.00

Scholarships

By a ruling of the Board of Trustees of the University, all high-school teachers in Illinois, and all other teachers in the State who are qualified to matriculate in the University as regular students, are entitled to Summer Session scholarships, exempting them from payment of the tuition fee. To matriculate regularly in the University, one must satisfy in full the entrance requirements for some one of the colleges as outlined on page 8.

By a more recent resolution of the Board of Trustees, the scholarship privilege is extended to graduates of the Illinois State normal schools, class of 1918, and to persons (otherwise qualified) who have not been teachers the past year but who are under contract to teach in the state during the coming year

A person who wishes to take advantage of the scholarship privilege should present to the Registrar prior to June 1, 1918, a statement from the board of education employing him, to the effect that he has either been teaching during the past year or is under contract to teach during the coming year. A normal school graduate (class of 1918) must present either a diploma or a written statement from the president of the normal school certifying that he is a graduate of this year's class.

Application blanks for scholarships may be obtained by addressing the Registrar.

The Bachelor's Degree

All the undergraduate work offered in the Summer Session carries regular university credit which may be counted, unless otherwise specified, towards the degree of Bachelor of Arts or Bachelor of Science. By careful selection of courses the graduation requirements of the College of Liberal Arts and Sciences may be met in large part by Summer Session work. In the Colleges of Engineering and Agriculture the non-technical requirements and a part of the technical engineering or agricultural requirements may be covered in the Summer Session. For the detailed requirements of the several colleges the student should consult the Annual Register of the University under the head of the college in which he is interested. *A student who is definitely a candidate for a degree* should also check over the work he has had and plan his future course in consultation with the dean or assistant dean of the college of his choice—

For the College of Liberal Arts and Sciences—Assistant Dean Canter, Room 304, University Hall.

For the College of Commerce and Business Administration—Acting Dean Weston, Room 104, Commerce Building.
For the College of Engineering—Assistant Dean Jordan, Room 300, Engineering Building.
For the College of Agriculture—Assistant Professor Rankin, Room 100, Agricultural Building.

General Assembly

On the first Thursday of the Session, at 4 p. m., an Assembly will be held in Room 218, University Hall. All students and members of the instructional staff are requested to attend. At this time general announcements will be made concerning lectures, entertainments, etc.

Lectures, Receptions, and Entertainments

In addition to the regular class exercises, the Summer Session provides a number of incidental exercises which give an atmosphere differing but little from that of the other sessions of the year: receptions given to the students; entertainments, debates, conferences, and clubs arranged by the students themselves; games and athletic contests; and the general lectures given by members of the University departments and by men from other institutions.

The song services, which proved so successful during recent Sessions, will be continued, under the direction of Director J. L. Erb of the School of Music. All students and faculty members are cordially invited to take part in the singing on the Auditorium steps each Wednesday evening, 6:45 (except in the first and last weeks).

Director Erb will give a series of six organ recitals during the summer.

The University Pageant Master, Mr. W. C. Langdon, will lecture on community drama and pageantry and will organize a pageant appropriate to the Fourth of July.

Preparation for State Teachers' Certificates

To teachers who desire to make thoro preparation for the state-certificate examinations, the Summer Session offers marked advantages, especially in connection with the professional subjects.

Among the provisions of the certificating law, enacted by the General Assembly in 1913, are the following examination requirements for the various kinds of certificates:

State Certificates

1. Four-year elementary-school certificate: Examination in English, educational psychology, and principles and methods of teaching.
2. Four-year high-school certificate: Examination in English, educational psychology, and principles and methods of teaching.
3. Four-year supervisory certificate: Requirements are the same as for the elementary-school certificate, except that the examination includes, in addition, sociology, history of education, and school organization, administration, and supervision.

County Certificates

1. Third-grade elementary-school certificate: Examination in common branches.
2. Second-grade elementary-school certificate: Examination in common branches, pedagogy, elementary science.
3. First-grade elementary-school certificate: Examination in the common branches, three of the natural sciences; English, algebra, general history and pedagogy.
4. High-school certificate: Examination in English, pedagogy, and six high-school subjects.
5. Supervisory certificate: Examination in English, educational psychology, history of education, and school administration.
6. Special certificate: Examination in English and principles and methods of teaching.

Examinations for the *State Elementary-School Certificate*, the *State Supervisory Certificate*, and the *State High-School Certificate* will be held at the University in July, *provided that at least fifteen applicants notify the State Superintendent prior to June 9, 1918, of their wish to take the examination here.*

The following excerpt from Circular No. 72 of the office of the State Superintendent of Public Instruction describes the new method of preparing theses:

"A thesis prepared under the direction of a teacher in a normal school, college or university, either in residence or by correspondence, and accompanied by a statement from such teacher as to the method and spirit of study, the originality and thoroughness shown by the candidate in such preparation and an estimate of the thesis, will be accepted. Candidates who cannot prepare a thesis under these conditions will be given three hours at the examination to write upon the subject selected."

"The thesis must be filed with the Superintendent of Public Instruction before July 14, 1918."

The instructors at the University will be glad to direct the preparation of theses to be submitted to meet the above requirements.

The following Summer Session courses are especially adapted to prepare for the professional examinations:

Education S-la, S-lb, and S-10; Principles and Methods of Teaching.

Education S-4, S-20, and S-21 will be valuable for those preparing theses for the State Supervisory Certificate.

Education S-2; History of Modern Education. (The applicant for the State Supervisory Certificate must pass an examination in the history of education.)

Education S-25; Educational Psychology. (This course, in connection with Education S-la, should prepare for the examination in educational psychology.)

Education S-6; The Principles of High-School Education.

Attention is also called to the various courses in English and rhetoric in connection with the English requirements for all certificates.

Graduate Work in the Summer Session

Recently the Summer Session has placed increasing emphasis on graduate courses leading to the master's degree. The various departments which are closely related to high-school teaching and to educational administration have been selected as the centers of this emphasis. An attempt is made to vary the graduate offerings from year to year so that advanced students who attend the University summer after summer may continue to find acceptable work in their chosen fields. During the coming summer especial emphasis will be laid on graduate courses in chemistry, economics, education, English, and mathematics.

The normal requirement for the master's degree is satisfactory work continued during one year of residence. This means a residence of thirty-six weeks at the University. Qualified graduate students may fulfill this residence requirement in four summer sessions of eight weeks each and an additional four weeks' study at the University under the direction of the person in charge of the major work. Thus the student by working at the University for one week after each Session under the direction of the professor in charge of his major subject may earn the master's degree in four summers

In certain cases it will be possible for the graduate student to complete the last fourth of his residence requirement under a leave of absence. This privilege may be granted in the event that the student is able to take advantage of opportunities for research and investigation that are not afforded in the University community. Superintendents, principals, and class-room teachers frequently find it possible to carry on investigation in connection with their school work. There are, for example, numerous problems of school administration and of teaching for which the public school itself forms the only available "laboratory". Where the investigation of such problems is prosecuted under the direction of a university department, it may be possible, on individual petition, to count the work toward the master's degree.

Vocational Education Courses

Courses will be offered in vocational education in preparation for teaching agriculture, home economics, and the industries under the terms of the Smith-Hughes Act. For such courses in the training of teachers of agriculture, see p. 26, and in home economics, see p. 26.

Courses for teachers of carpentry, cabinet making, and pattern making and for machinists and tool makers will be offered in the department of industrial education under the direction of Professor Ira S. Griffith. To be eligible for admission to industrial courses in this summer session a student must have had experience in teaching in the grades or high school and at least two full years of successful trade experience beyond the apprenticeship stage or beyond the time when he began and continued to draw a journeyman's wage. Students who are interested in the courses in industrial education may obtain from the Director of the Summer Session a full announcement of the schedule of these courses and a statement of the opportunities for obtaining positions as teachers of vocational education under the Smith-Hughes Act.

Courses in Library Training

Beginning Monday, June 17, 1918, and continuing for six weeks, the Library School will conduct courses to which will be admitted only high-school graduates actually employed as librarians, or library assistants, or as teacher-librarians, or under definite appointment to serve in such positions. The curriculum will meet especially the needs of workers in college, public, and high-school libraries of Illinois, and no tuition fee will be charged students entering from a library in this state; students entering from libraries in other states will pay a tuition fee of $12. The work is under the general direction of the faculty of the Library School, and the instruction will be given by members of the faculty, supplemented by lectures by neighboring librarians. *No credit toward a degree is given for the work.*

For further information than that contained in the description of courses, [page 26] address the Director of the University of Illinois Library School, Urbana, Illinois.

Courses for Athletic Coaches

Courses for Athletic Coaches were established in connection with the Summer Session of 1914, under the general direction of George A. Huff, Director of Physical Training for men, to meet the growing demand, not only from high schools, but from colleges and other institutions as well, for trained men to direct and coach athletics. They were designed to assist both the high-school teacher or principal who desired to become proficient in coaching one or more athletic teams and the man who intended to take up the directing of athletics or coaching as a vocation. The class registrations were: in 1914, 254; in 1915, 669; and in 1916, 690.

The courses will again be a feature of the Summer Session, occupying the first six weeks. All the courses will be taught by the men who coach the athletic teams of the University of Illinois: in baseball (Director Huff), track athletics (Mr. Harry Gill), basketball (Mr. Ralph Jones), and football (Mr. Robert Zuppke). The athletic plant of the University is turned into a laboratory and the larger part of the instruction is given on Illinois Field.

Students may devote either their whole time, or part of their time to these courses. Detailed information regarding the courses for Athletic Coaches may be found in a special circular which will be sent on application to George A. Huff, Director, Gymnasium, Urbana, Ill.

Athletics

Altho both the men's and the women's gymnasiums will be used in some parts of the regular class work in Physical Training, they are nevertheless open to students not registered in those courses, for the purpose of general recreation and exercise. Both of the gymnasiums contain swimming pools, shower baths and other forms of bath, lockers, and dressing rooms. Students are charged a small sum for a locker. The tennis courts, general athletic fields, and golf course on the University campus are open to the student body.

Board and Lodging

The fact that the larger part of the usual University community will be away at the time of the Summer Session will make lodgings and boarding accommodations plentiful. The Young Men's and Young Women's Christian Associations of the University will prepare a list of boarding places which can be recommended, and they will aid students in securing desirable locations.

Board may be obtained at from $4.75 to $5.50 a week.

Double rooms in pleasant localities near the University may be had at from $8 to $10 a month.

Information

For further information on any matter connected with the Summer Session, address the Registrar or

THE DIRECTOR OF THE SUMMER SESSION,
304 University Hall,
Urbana, Illinois

DESCRIPTION OF COURSES

Explanation

The arrangement of subjects in the following description of courses is alphabetical. The connections of allied departments are indicated by cross references.

"S" (summer) which is prefixed to each of the courses offered is the sign used to distinguish the Summer Session courses from those having the same number offered during the regular University year. Following the description of each course will be found a statement of requirements for admission to that particular course and a statement of the equivalency of credit for such course as related to the course given in other sessions of the University. For example, the prerequisite for mathematics 9 is mathematics 7. This means that mathematics 7 must be completed before mathematics 9 may be taken. Since the Summer Session courses do not invariably cover the same ground as courses similarly numbered in the regular sessions of the University, the equivalency is sometimes noted as partial rather than full.

If a course not required for graduation is selected by fewer than five students, it may be withdrawn.

Graduate courses are numbered upwards from 100. Such courses are open only to graduate students.

Credit is reckoned for undergraduate students in *semester hours* or simply *hours*. An *hour* represents one classroom period a week for one semester, or the equivalent in laboratory, shop, or drawing room. The number of hours for which each course counts is shown after each course by a figure in parenthesis, for example, Education S 1A (3).

The following abbreviations are used to designate the different buildings used during the Summer Session:

Adm	Administration Building
Agr	College of Agriculture
Chem	Chemistry Laboratory
Com	Commerce Building
E.H	Engineering Hall
Farm Mech	Farm Mechanics Building
App. Mech	Laboratory of Applied Mechanics
Law	Law Building
L.H	Lincoln Hall
Physics	Physics Laboratory
N.H	Natural History Building
Stock Pav	Stock Pavilion
U.H	University Hall
Viv	Vivarium Building
W.B	Woman's Building

AGRICULTURE AND AGRICULTURAL EDUCATION

(See Agronomy, Animal Husbandry, Horticulture, and Agricultural Economics.)

Assistant Professor Nolan, in charge of courses given by the College of Agriculture; Mr. Colvin and Mr. Greene

(All courses given in the College of Agriculture are designed for teacher training in vocational agriculture, meeting the provisions of the Smith-Hughes Act for Vocational Education.)

S 90. **Problems of Rural and Agricultural Education.**—Designed primarily for superintendents and principals who are concerned with the problems and administration of rural and agricultural education. Rural life conditions and needs, and the agencies for improvement. The place and development of agricultural education in rural progress. M.T.W. 3; 122 Agr. (2).
Assistant Professor Nolan

S 1. **Elementary Agriculture.**—A few major phases of agronomy, animal husbandry, horticulture, and farm business. Selection of subject-matter and methods of presentation for elementary and secondary schools. Lectures, demonstration, and field trips. M.T.W.T.F. 10; 553 Agr. (2½). Mr. Colvin

S 6. **The Teaching of Agriculture.**—Principles and methods in the teaching of vocational agriculture under the Smith-Hughes law. M.T.W.T. 9; 553 Agr. (2). Mr. Colvin

Equivalent: Agricultural Extension 6 (in part.)

Prerequisite: one year or its equivalent in technical agriculture.

S 7. **The Project Method in Agriculture.**—Organization, motivation, and direction of home project work in vocational agriculture with special reference to the training of directors for supervised farm practise. Observation and study of home project methods in neighboring communities. M.T.W.T. 8; 553 Agr. (2). Mr. Greene

Equivalent: Agricultural Extension 7 (in part).

AGRONOMY

Assistant Professor White, Mr. Wyatt, Mr. Walworth

S 25. **Farm Crops.**—Plant growths, structure; production and harvesting; habits, characteristics, requirements, means of improvement; common diseases; insects and their control; weeds and seed identification; weed control; seed testing; market grades of grain; grain judging. Emphasis on material and methods of presentation adapted to teaching in secondary schools. M.T.W.T. 10, 11; 600 Agr. (2). Mr. Walworth

Equivalent: Agronomy 25 (in part).

S 9a. **Soils.**—Soil formation and fertility; crop rotation; value of fertilizers and farm manures as measured by crop yields; sources of limestone; organic matter, phosphorus, and potassium; Illinois system of permanent fertility. Lectures and laboratory work. M.T.W.T.F., 1, 2; 600 Agr. (2½). Mr. Wyatt

Prerequisite: One year of chemistry.

S 26. **Elementary Farm Mechanics.**—Ropes, soldering, babbitting, belt lacing, pipe cutting, plumbing, sewage disposal, farm water supply systems, lighting systems, heating systems, power transmission, and equalizers. Methods of organizing and presenting this material for secondary schools and home project work. M.T.W.T.F. 1, 2; 205 F.M. (2½).
Assistant Professor White

Equivalent: Agronomy 26 (in part).

S 28. **Farm Machinery.**—The more important farm machines, such as plows, binders, mowers, etc. The horse and tractor as prime movers. Methods of adapting this material to the needs of secondary schools and home project work. M. T. W. T. F. 3, 4; 205 F.M. (2½).
Assistant Professor White

Equivalent: Agronomy 23 (in part).

ANIMAL HUSBANDRY

Assistant Professor DETLEFSEN, Mr. BARTO, Mr. SMITH

S 5a. Animal Husbandry for Schools.—The types and breeds, judging, feeding, breeding, care, and management of live-stock, with special reference to the methods of teaching animal nusbandry in schools. M.T.W.T.F. 8; St. Pav. (2½). Mr. SMITH

Equivalent: Animal Husbandry 5 (in part).

S 2c. Swine Production Projects.—The breeds, selection, breeding, feeding, care, and management of swine. Designed to aid teachers in the pig project work of vocational agriculture. Observation and practise in swine production. M.T.W.T. 9; St. Pav. (2). Mr. SMITH

S 23. Poultry.—Principles and practises of poultry raising on the farm and at the village home. Identification and comparison of breeds; housing, feeding, fattening, marketing; handling eggs, hatching and raising chicks, caponizing, etc. Time to be arranged. (2½). Mr. BARTO

Equivalent: Animal Husbandry 23 (in part).

S 23a. Poultry Projects.—A practise course in which a flock of fowls will be used by the students to demonstrate the methods of carrying on a poultry project at school or at home. M.W.F. 11; St. Pav. (1½ to 2½). Mr. BARTO

S 30. Genetics.—Principles of breeding and genetics in their relation to plant and animal improvement. Methods of teaching, selection of pertinent illustrative material, subject matter, and types of observation and projects possible for secondary schools. M.T.W.T. 11; 107 Genetics; (2). Assistant Professor DETLEFSEN

Equivalent: Animal Husbandry 30 (in part).

ART AND DESIGN

Assistant Professor LAKE

S 1. Elementary Art.—Form drawing from still-life, cast, and nature; outline and shading in pencil, charcoal, and crayon: lectures on perspective. M.W.F., 1. 2,; 405 U. H. (3). Assistant Professor LAKE

Equivalent: Art and Design 1.

S 9. Art for the Common Schools.—The planning and execution of work in common-school art study; design; black-board drawing. Lectures on organization, equipment, and the administrative side of the supervisor's work. For supervisors of drawing, and public-school teachers. T.T., 1, 2; 405 U.H. (1). Assistant Professor LAKE

S 12. Design.—Theory and practise; theory of pure design and the effect of material on execution; fitness of different forms of media for different sorts of design; space division and space relations; color; color schemes and exercises; conventionalization of natural forms for various functions: execution. M.W.F., 3; 402 U.H. (2). Assistant Professor LAKE

Equivalent: Art and Design 12.

S 20. History of the Fine Arts.—Periods and styles of architecture, sculpture, and painting during the Italian Renaissance and up to the present time. M.W.F., 4; 410 U.H. (2). Assistant Professor LAKE

Equivalent: Art and Design 20.

BOTANY

Professor HOTTES, Dr. McDOUGALL, Mr. ————————

Courses for Undergraduates

S 1. General Botany.—Structure, physiology, natural history, and uses of plants. Lecture T.W.T., 8; 228 N.H. Laboratory T.W.T., 9—12; 216 N.H. (4). Dr. McDOUGALL

Equivalent: 4 hours of Botany 1.

S 27a. Plant Physiology.—Absorption of materials and their transformation within the organism; production and use of food; processes fundamental to agriculture—crop production. Lecture-quiz M.W.F., 10. Laboratory M.W.F., 8-10, 11; 308 N.H. (4). Professor HOTTES

Prerequisite: Botany 1 or its equivalent.

Equivalent: 4 hours of Botany 27a.

Courses for Advanced Undergraduates and Graduates

S 9b. Plant Physiology.—Physiological problems for those specializing in plant physiology or in its applications to plant breeding, crop production, or plant pathology. Arrange time; 104 Botany Annex. (2-3). Professor Hottes

Prerequisite: 10 hours of botany, including Botany 27a or 27b or the equivalent; junior standing.

Equivalent: Botany 9b (in part).

S 25. Plant Ecology.—Advanced studies in the ecology of plants or of plant communities. Arrange time; 304 N.H. (2-3). Dr. McDougall

Prerequisite: Botany 23 and 27a or their equivalent; junior standing.

Equivalent: Botany 25a or 25b (in part).

Course for Graduates

S 102. Plant Physiology.—Research: reports and discussions of results and of current literature. Arrange time: 104 Botany Annex. (½-1 unit). Professor Hottes

BUSINESS ORGANIZATION AND OPERATION

Mr. Littleton, Dr. Britton

A ACCOUNTANCY

S 1a. Principles of Accounting.—Accounting and bookkeeping. Accounting procedure. T.W.T.F., 9, 10; 303 Com. (3) Mr. Littleton

Equivalent: Accountancy 1a.

S 15. Teachers' Course in Accounting.—Methods of approach in teaching; conduct of laboratory work; explanation of difficult transactions; logical development and treatment of columnar books, notes and drafts, interest, discount, controlling accounts, specialized books and records, inventories and financial statements. Lectures on different systems in use. Primarily for high-school teachers; others admitted by permission of the instructor. M.T.W.T.F., 11; 206 Com. (2). Mr. Littleton

B. BUSINESS ORGANIZATION AND OPERATION

S 1. Business Organization and Operation.—Forms of business organization, partnerships, joint stock companies, corporations, trusts, pools and combinations; problems in regulation and control; rights and liabilities of members and officers, rights of creditors; business and legal problems in the internal organization and conduct of business. Army organization compared with industrial organization. (Not accepted for credit for students in the College of Commerce and Business Administration.) M.T.W.T.F., 10; 206 Com. (2). Dr. Britton

C. BUSINESS LAW

S 1. Commercial Law.—Contracts; agency; sales; negotiable instruments; cases; readings and lectures. Effect of war on the execution of contracts and use of negotiable instruments. (This course is not accepted for credit for students in the College of Commerce and Business Administration.) M.T.W.T.F., 8; 206 Com. (2). Dr. Britton

CHEMISTRY

Assistant Professor Lewis, Dr. Beal, (in charge), Dr. Deming, Dr. Cann, Dr. Kamm, Dr. Anderegg, Dr. Braley, Dr. Kremers, Mr. Rindfusz, Mr. Howell, Mr. Van Winkle, Miss Sparks

Note: All of the courses in chemistry in the Summer Session are equivalent to the courses of the same numbers given during the academic year.

S 1. Elementary Chemistry.—The non-metallic elements. Text: Noyes' *Text Book of Chemistry*. Lecture—quiz, M.T.W.T.F.S., 11; Laboratory, M.T.W.T.F.S., 8, 9 or 9, 10; Chem. (5). Dr. Deming, Dr. Anderegg, Dr. Kremers

S 1a. Inorganic Chemistry.—For students who have had one year of high-school chemistry. This course may be taken at the same hours as Chemistry S 1, but only four hours of laboratory work are required. Chem. (3). Dr. Deming, Dr. Anderegg, Dr. Kremers

S 1b. Inorganic Chemistry.—For engineering students. This course may be taken at the same hours as Chemistry S 1, but only six hours of laboratory work are required. Chem. (4). Dr. Deming, Dr. Kremers

S 2a. Inorganic Chemistry and Qualitative Analysis.—Chemistry and qualitative analysis of the more common metals and inorganic compounds. Texts: Noyes' *Text Book of Chemistry*, Noyes and Smith's *Qualitative Analysis*. Lectures, M.T.W.T., 9; Quiz, M.T.W.T., 8; Laboratory, M.T.W.T.F.S., 10, 11; Chem. (5). Dr. Cann, Dr. Anderegg

Prerequisite: Chemistry 1 or 1a.

S 3a. Inorganic Chemistry and Qualitative Analysis.—For students in chemistry and chemical engineering. Texts: Noyes' *Text Book of Chemistry*, Noyes and Smith's *Qualitative Analysis*. Arrange; Chem. (6). Dr. Cann, Dr. Anderegg

Prerequisite: Chemistry 1.

S 5a. Elementary Quantitative Analysis.—Gravimetric and volumetric methods; stoichiometrical relations, the fundamental laws of chemistry and their applications to quantitative analysis. Text: Talbot's *Quantitative Chemical Analysis*. Lecture or quiz, M.T.W.T., 8; Laboratory, M.T.W.T., 9-12. F., 8-12. 260 Chem. (5). Dr. Beal, Dr. Braley, Mr. Van Winkle

Prerequisite: Chemistry 2a or 3a.

S 13a. Agricultural Analysis.—Gravimetric and volumetric analysis; analysis of fertilizers and milk. Parallel with Chemistry 5a. Talbot's *Quantitative Chemical Analysis*. (For students in agriculture and household science) Lecture or Quiz, M.T.W.T., 8; Laboratory, M.T.W.T., 9-12, F., 8-12; 260 Chem. (5). Dr. Beal, Dr. Braley, Mr. Van Winkle

Prerequisite: Chemistry 2a or 3a.

S 17. Teachers' Course.—Methods of teaching elementary chemistry. T.T., 10; Chem.; (1). Dr. Deming

Prerequisite: One year's work in chemistry.

Courses for Undergraduates and Graduates

S 14a. Elementary Organic Chemistry.—This course should be accompanied by laboratory work, S 14c. M.,T.,W.,T.,F.,S., 8; 217 Chem. (3). Dr. Kamm, Mr. Rindfusz

Prerequisite: Chemistry S 2a or S 3a or equivalent courses.

S 14b. Organic Chemistry (second course).—Continuation of Chemistry S 14a, with emphasis on special chapters. Library assignments. Not given unless elected by more than three students. M.,T.,W.,T.,F., 11; 217 Chem. (3). Dr. Kamm, Mr. Rindfusz

Prerequisite: Chemistry S 14a and S 14c or equivalent.

S 14c. Organic Chemistry (elementary laboratory).—Typical laboratory methods; syntheses of some of the more important organic compounds. Four times a week, 9-12; 250 Chem. (2). Mr. Rindfusz, Mr. Howell

Prerequisite: Registration in Chemistry S 14a or completion of a course equivalent to S 14a.

S 14d. Organic Chemistry (advanced laboratory).—Synthetical preparations in organic chemistry, together with several weeks of both qualitative and quantitative organic analysis. Four times a week, 8-11; 250 Chem.; (2). Dr. Kamm, Mr. Rindfusz

Prerequisite: Registration in Chemistry S 14b or completion of a course equivalent to S 14b.

S 15. Physiological Chemistry.—Enzymes; carbohydrates; salivary digestion; gastric digestion; fats; pancreatic digestion; intestinal digestion, bile putrefaction products; feces; blood, milk; epithelial and connective tissues; muscular tissue; nervous tissue; urine. Qualitative and quantitative work on gastric juice, blood, urine, and milk; the clinical aspects of these

topics treated thoroughly for the prospective student of medicine. Lectures; demonstrations; conferences; practical work; assigned reading. Mathews' *Physiological Chemistry*, 2d Ed.; Hawk's *Practical Physiological Chemistry*, 5th Ed. M.T.W.T.F., 8-12; 463 Chem. (5).
Assistant Professor Lewis

Prerequisite: Chemistry 5a or 13a, and 14a-b or 9 and 9c, or equivalent.

S 21. Qualitative Organic Analysis.—Systematic methods for the identification of pure organic compounds and mixtures. Four times a week, 8-11 or 9-12; 250 Chem. (2).
Dr. Kamm, Mr. Howell

Prerequisite: Chemistry S 14b and S 14d or equivalent.

S 25 (formerly S 5c). Food Analysis.—Quantitative organic analysis; examination of food and drug products: alcohols, carbohydrates, fats and oils, animal and vegetable foods, nitrogenous bodies, preservatives, and colors. Sherman's *Organic Analysis* and Sherman's *Food Products*, "*Bulletin* 107, *rev., U. S. Bureau of Chemistry.*" Lecture, M.T.W.T.F., 11; Laboratory, M.T.W.T.F., 8-11; Chem. (5). Dr. Beal, Mr. Van Winkle

S 26. Pharmaceutical Chemistry.—The analytical chemistry of medicinal substances, with a discussion of the common types of pharmaceutical preparations. *United States Pharmacopoeia, Ninth Decennial Revision.* Not given unless elected by more than four students. Lectures, M.W.F., 8; Lab., M.W.F., 9-12; 260 Chem. (3). Dr. Beal

Prerequisite: Chemistry 14a-14b.

S 65. **Technical Gas and Fuel Analysis.**—Examination of gases, gas mixtures, flue gases and fuels; determination of calorific values; calculation of efficiencies. Lecture, laboratory. White, *Gas and Fuel Analysis*. S. W. Parr, *Chemical Examination of Water, Fuel, Flue Gas and Lubricants*. M.W.F., 8-12; 260 Chem. (2). Dr. Braley

S 92. Chemical Literature and Reference Work.—Periods, leaders, journals; use of literature. Lectures, reports, reference work. Two periods a week; arrange. (1). Miss Sparks

S 11 and S 111. Research.—Advanced work for undergraduates (S11) and research work for graduates (S 111), in inorganic, organic, analytical, or physiological chemistry. Arrange hours and credit before registration.

Inorganic Chemistry — Dr. Deming
Analytical Chemistry — Dr. Beal
Physiological Chemistry — Assistant Professor Lewis
Organic Chemistry — Dr. Kamm

THE CLASSICS

LATIN

Professor Barton, Associate Professor Canter

S 1. High-School Latin.—Representative readings from the second, third, and fourth years, with discussions of material as reflecting Roman public and private life, political and religious ideals. Attention will be given to the most effective ways of organizing and presenting the materials of Latin instruction in secondary schools. Students should provide themselves in advance with texts of Caesar, Cicero, and Vergil. M.T.W.T.F., 3; 120 L.H. (2½).
Professor Barton

S 2. Pliny.—Selected letters, an insight into the literary and social conditions of the Empire. M.W.F., 8; 120 L.H. (1½). Associate Professor Canter
For students with two or three years of high-school Latin.

S 3. Roman History.—The period covered will extend from the beginning to the fall of the Republic. T.T.S., 8; 120 L.H. (1½). Associate Professor Canter

S 4. Teachers' Course.—Special attention to problems and methods of instruction in Latin in the secondary schools; books and equipment. The slides and photographs of the classical department and the classical museum will be at the disposal of the class. M.W.F., 2; 120 L.H. (1½). Professor Barton

Course for Graduates

S 101. Roman Epigram.—Catullus and Martial will form the center of the work; lectures and discussions on the origin and development of the epigram as a department of literature, its technic and chief representatives on Roman soil. T.T., arrange time. 114 L.H. (½ unit).
Associate Professor Canter

DAIRY HUSBANDRY

Mr. Yapp

S 2-3. **Dairy Farming.**—Dairy cattle; judging, feeding, and management—"the Babcock test" for milk and cream. Production and care of milk on the farm. For high-school teachers of dairying. M.T.W.T.F., 8; 454 Agr. (2½). Mr. Yapp

Equivalent: Dairy Husbandry 2 and 3 (in part).

ECONOMICS

(See also Business Organization and Operation.)

Assistant Professor Litman, Dr. Stewart, Dr. Hunter

S 2. **Principles of Economics.**—M.T.W.T.F.S., 10; 101 Com. (3). Dr. Stewart

Prerequisite: One year of university work or (for teachers) the permission of the instructor.

Equivalent: Economics 2.

S 3. **Money and Banking.**—M.T.W.T.F., 9; 111 Com. (2½). Dr. Hunter

Prerequisite: A 5-hour course in the principles of economics or the permission of the instructor.

Equivalent: To Economics 3 when used as a prerequisite.

S 16c. **Agricultural Economics.**—The economic principles underlying the farming industry and the conditions of rural community life. Primarily for teachers of agriculture in secondary schools. M.T.W.T.F., 11; 101 Com. (2½). Dr. Stewart

Prerequisite: Economics 1 or 2 or (for teachers) the permission of the instructor.

Equivalent: Economics 16c.

S 26. **Industrial Resources of the Nations at War.**—M.T.W.T.F., 8; 204 Com. (2½). Assistant Professor Litman

Courses for Undergraduates and Graduates

S 4. **Experiences of the United States in War Finance.**—Principles of war finance. Methods used by the United States in war finance from the Revolutionary war to the present conflict. Problems arising from the methods employed with special emphasis on the present war. Readings, lectures, and discussions. M.T.W.T.F., 8; 111 Com. (2½) Dr. Hunter

Prerequisite: Five hours in the principles of economics and the permission of the instructor.

S 29. **International Trade.**—The methods of controlling imports and of promoting sales in foreign markets with the aim of ascertaining what should be the after-war policy of the leading commercial nations. M.T.W.T.F., 9; 204 Com. (2½). Assistant Professor Litman

Prerequisite: A 5-hour course in the principles of economics and the permission of the instructor.

EDUCATION

(See Also Psychology.)

Professors Charters, Hollister, Hill, Monroe, and Rhoton, Mr. Stevenson, Mr. Williams, Miss Smith, and Mr. Griffith

Note: The prerequisites as stated in connection with the following courses may, in the discretion of the head of the department and the instructor in charge of each course, be modified in their application to teachers who may desire to enroll in the courses in question.

Courses for Undergraduates

S 1a. Principles of Education.—The function of education; formal and informal education; fundamental principles of physical and mental development and their relation to the art of teaching; the problem of educational values. M.T.W.T.F., 9; 208 U.H. (2½).
Mr. Stevenson

Prerequisite: Junior Standing.

Equivalent: With Education S 1b, this course is equivalent to Education 1 as offered during the university year. Education 1 is required of all students who secure the official recommendation of the Appointments Committee for teaching positions in secondary schools.

S 1b. The Educational System.—The school system of the United States, its present organization, its origin, its distinctive characteristics as compared with other systems, its present problems. Lectures and readings. M.W.F., 2; 208 U.H. (1½). Mr. Williams

Prerequisite: Junior standing.

Equivalent: With Education S 1a, this course is equivalent to Education 1.

S 2. History of the Evolution of Educational Theory and Practise in Modern Times, beginning with the Renaissance.—Educational movements in Europe; review of the common school revival in America. Text: Monroe, *History of Education*. Lectures, readings, and discussions. M.T.W.T.F., 1; 113 Lincoln Hall. (2½). Professor Rhoton

Prerequisite: Junior Standing.

Equivalent: Education 2 (in part).

S 10. The Technic of Teaching.—Types of classroom exercises and the preparation of teaching plans; hygiene; classroom management; professional ethics. (Required, by Senate ruling, of all students who secure the official recommendation of the Appointments Committee for teaching positions in secondary schools.) M.T.W.T.F.S., 8; 211 U.H. (3).
Mr. Williams

Prerequisite: Education 1.

Equivalent: Education 10.

S 25. Educational Psychology.—An introduction to the applications of modern psychology to educational problems. Lectures, readings, class experiments. M.T.W.T., 9; 417 U.H. (2). Professor Hill

Prerequisite: Junior standing.

Equivalent: Education 25 (in part).

S 90. Problems of Rural and Agricultural Education—See Agriculture and Agricultural Education S 90.

Courses for Graduates and Undergraduates

S 4. School Organization and Administration.—A course for school superintendents and principals. The establishment of schools and provisions for their administration; units of control; the development of school administration and school support, the superintendent's work; training, selection, and rating of teachers; methods of supervision; organization of curricula; uses of scales and standards in determining efficiency. Lectures, readings, and reports. M.W.F., 11; and one additional period to be arranged, 202 L.H. (2). Mr. Stevenson

Prerequisite: Education 1 or equivalent.

Equivalent: Education 4 (in part).

S 6. The Principles of High-School Education.—The evolution of high schools and of secondary education; high schools and the state system; legal status; articulation with elementary school, college, technical schools, community, and home; teaching staff; reorganization of curriculums; "controls" of construction; student activities; vocational and moral guidance; school journalism; debating activities; athletics; high-school hygiene. M.T.W.T., 10; 202 L.H. (2). Professor Hollister

Prerequisite: Education 1, or equivalent.

Equivalent: Education 6 (in part).

S 18. Method in Educational Research.—Statistical and other methods as applied to educational investigation. (This course is ordinarily required of all candidates for advanced degrees). T.W.T.F., 2; 113 L.H. (2). Professor Monroe

Prerequisite: Education 1.

Equivalent: Education 18.

S 20. Supervision.—A course for superintendents, principals, and supervisors. Limitations, types, functions, standards, and devices of supervisors; subject limits and time limits of the course of study; adaptation of the materials of the course of study to types of mind; rating of teachers; improvement of teachers in service; technic of criticism. Lectures, readings, and investigations of special problems. M.T.W.T., 9; 207 U.H. (2). Professor HOLLISTER

Prerequisite: Education 1 or equivalent.

Equivalent: Education 20 (in part).

S 21. Units, Scales, and Standards.—A course for school superintendents, supervisors, and teachers. Units, scales, and standards for measuring educational achievement or determining progress in arithmetic, spelling, handwriting, reading, composition, drawing, history, and geography. Lectures, readings, and the investigation of some special problem in educational measurement. M.T.W.T., 10; 208 U.H. (2). Professor MONROE

Prerequisite: Education 1 or equivalent

S 26. The Junior High School.—A course for superintendents, principals, and junior high-school teachers. A study of the history, organization, purposes, criticisms, subject matter, and methods of the junior high school. Curriculum organization and special methods in junior high schools; a study of the available literature and a few typical junior high schools. Lectures, readings, and investigations of special problems. T.T., 11; 202 L.H. (1).

Mr. STEVENSON

Prerequisite: Education 1 or equivalent. (Superintendents, principals, and supervisors may in the discretion of the instructor be admitted to the course without the prerequisite.)

S 31. Teacher Training Course.—Study of curricula, methods of teaching, and organization of high-school courses for the training of rural and village school teachers. Special consideration is given to the administration of teacher training classes in high schools. M.T.W.T., 2; 202 L.H. (2). Professor CHARTERS

Prerequisite: Eleven hours of education and experience in teaching.

S 41. Introduction to Vocational Education.—Vocational aspects of education within American Democracy. Social significance, as related to elimination, poverty, crime. Problems of support, legislation, administration, methods, and contemporary tendencies. The Smith-Hughes Law applied to agricultural, and trade, and home economics, and industrial subjects. The procedure in industrial research for education. Lectures, readings, and reports. M.T.W.T., 8; 202 L.H. (2). Professor HILL

Prerequisite: Six hours of education.

Courses for Graduates Only

Prerequisite for all graduate courses: Graduate standing, with preliminary courses satisfactory to the instructor.

S 106. Seminar in High-School Administration.—Problems in high-school administration. M., 4-6; 103 L.H. (½ unit). Professor HOLLISTER

S 118. Seminar in Educational Research.—Statistical and other methods applied to the investigation of educational problems. Special attention will be paid to data used by superintendents. Th., 4-6; 103 L.H. (½ unit). Professor MONROE

S 119. The Elementary-School Curriculum.—An examination and criticism of the bases of typical curricula. The principles of curriculum making; the technic of the selection of subject-matter on the basis of utility. Tu., 4-6; 103 L.H. (½ unit). Professor CHARTERS

S 125. Seminar in Educational Psychology.—Subject: The rehabilitation of disabled soldiers, sailors, and workers in industries. W., 4-6; 417 U.H. (½ unit). Professor HILL

ELECTRICAL ENGINEERING

Assistant Professor WALDO, Mr. KNIGHT, Mr. ————

S 94. Radio Communication.—An intensive course designed primarily for men who intend to enter the National Service. It will require the full time of students registering for the course. Limited to 25 students. Hours to be arranged. (8).

Prerequisite: Junior standing in the College of Engineering, or equivalent.

Equivalent: Electrical Engineering 94.

ENGLISH

A. LANGUAGE AND LITERATURE

Professor DODGE, Professor PATTEE, Professor COCHRAN, Dr. CREEK, Mr. CURL, Mr. WHITFORD Miss COPLEY

S 1a. Survey of English Literature.—Chaucer and his contemporaries, the popular ballads, Malory, the Renaissance, the Reformation, Elizabethan Prose, Spenser, the Elizabethan lyric, Shakespeare, Bacon, Cavalier lyrics, religious lyrics, Milton. Text: *Century Readings in English Literature* (Part 1). M.T.T.F., 9; 307 U.H. (2). Professor DODGE

Prerequisite: One year of college work or the equivalent.

Equivalent: First half of English 1. (Together with S 1b this course covers the work of English 1. To be credited as equivalent to English 1, S 1b and S 1a should be taken simultaneously.)

S 1b. Survey of English Literature.—Bunyan and the prose of the Puritans, the Restoration, Dryden, Swift, the periodical essayists, Pope and the pseudo-classical school, DeFoe and the novelists, Thomson, Gray, Samuel Johnson, Goldsmith, Cowper, Burns. Text: *Century Readings in English Literature* (Part 1). M.T.T.F., 11; 307 U.H. (2). Mr. CURL

Prerequisite: One year of college work or the equivalent.

Equivalent: Second half of English 1. (To be credited as equivalent to English 1, S 1b and S1a should be taken simultaneously.)

S 12. American Literature.—Bryant, Irving, Cooper, Hawthorne, Emerson, Poe, Longfellow, Whittier, Lowell. Lectures, discussions, readings, and reports. Text: Page's *Chief American Poets*. T.W.T.F., 9; 202 L.H. (2). Professor PATTEE

Prerequisite: One year of college work or the equivalent.

Equivalent: English 12.

S 23. Shakespeare.—Two Gentlemen of Verona, Midsummer Night's Dream, Richard III, Romeo and Juliet, Henry V., Much Ado, Twelfth Night, As You Like It, Othello, Lear, Coriolanus, Winter's Tale, Tempest. Text: *The Tudor Shakespeare*. M.T.W.T.F.S., 8; 315 U.H. (3). Dr. CREEK

Prerequisite: One year of college work or an equivalent.

Equivalent: English 23 (in part).

Courses for Undergraduates and Graduates

S 4. History and Principles of English Versification.— M.T.W.F., 9; 315 U.H. (2). Dr. CREEK

Prerequisite: Sixteen hours of English, or junior standing and the consent of the instructor.

Equivalent: English 4.

S 45. Contemporary European Drama.—The "theatre of ideas," Teutonic naturalism, and the peasant drama of England and Ireland. Modern stage-craft. Ibsen, Strindberg, Hauptman, Schnitzler, Hofmannsthal, Zola, Becque, Brieux, Hervieu, Maeterlinck, Shaw, Galsworthy, Masefield, Barker, Synge, Fitch, Moody, and others. M.T.W.T.F.S., 11; 110 L.H. (3). (Attention of those who register in this course is called to Public Speaking S 10.) Professor DODGE

Prerequisite: Sixteen hours of English literature. Open to any upperclassman or graduate student with the consent of the instructor.

Equivalent: English 45.

S 55. English Literature of the Nineteenth Century.—The evolution of the England of to-day from the England of the eighteenth century. M.T.W.T.F., 10; 218 L.H. (2½). Professor PATTEE

Prerequisite: Sixteen hours of English literature. Open to any upperclassman with the consent of the instructor.

Course for Graduates Only

S 101. Research in Special Periods.—Individual conferences arranged with graduate students engaged on definite pieces of investigation. Professors Dodge and Pattee, Dr. Creek

B. RHETORIC

Mr. Curl, Mr Whitford, Miss Copley

S 1. Rhetoric and Themes.—Principles of structure; grammar; punctuation; the sentence; reasoning processes. Four short themes a week and an occasional long theme. Oral and written exercises. Texts: *Handbook of Composition* and Scott and Denney's *Paragraph Writing.* M.T.W.T.F.S., 309 U.H. (3). *Two sections*: A at 8, Miss Copley; B at 9, Mr. Whitford

Prerequisite: Entrance credit in English.

Equivalent: Rhetoric 1.

S 2. Rhetoric and Themes.—Principles of argumentation, narration, and description. Text: Scott and Zeitlin's *College Readings.* M.T.W.T.F.S., 10; 308 U.H. (3). Mr. Whitford

Prerequisite: Rhetoric 1.

Equivalent: Rhetoric 2.

S 6. The Short Story.—Study of the theory of the short story illustrated by recognized masterpieces and the best work of current magazines. Practical application of the theory by writing six stories of 2500-6000 words. Text: B. C. Williams's *A Handbook for Story Writing.* M.T.W.T.F.S., 218 L.H. (3). Mr. Curl

Prerequisite: Two years of college work and the consent of the instructor

Equivalent: Rhetoric 6.

C. PUBLIC SPEAKING

Professor Cochran

S 1. Oral Expression.—Theory and practise of expression for public and private address. M.T.T.F., 11; 318 U.H. (2). Professor Cochran

Prerequisite: Rhetoric 1 and 2 or equivalent.

Equivalent: Public Speaking 1.

(Credit is not given for this course unless it is followed by Public Speaking 2 or 10, or the equivalent.)

S 10. Interpretation and Dramatization.—Oral reading of types of literature; practical dramatic training; principles of stage action; staging and acting of plays. (Attention of those who register in this course is called to English S 45.) M.T.T.F., 2; 318 U.H. (2). Professor Cochran

Prerequisite: Public Speaking 1 or equivalent.

Equivalent: Public Speaking 10.

S 11. Argumentation and Debate.—Theory and practise of debating; team and individual competition; special attention to problems of coaching. M.W., 3; 318 U.H. (1). Professor Cochran

Prerequisite: Public Speaking 1 and 2.

Equivalent: Public Speaking 3 (in part).

ENTOMOLOGY

Assistant Professor Folsom, Dr. Glasgow

S 1. General Field and Laboratory Course.—Essential facts of entomology; its economic importance. Lectures, laboratory, and field trips. Text: Folsom's *Entomology with Reference to its Biological and Economic Aspects.* T.W.T.F., 1, 2; 405 N.H. (2). Assistant Professor Folsom, Dr. Glasgow

S 3. Economic Entomology.—Stages of development of common injurious insects. Laboratory, lectures, and field trips. M.T.W.T.F., 1, 2, and two additional hours; 408 N.H. (3). Assistant Professor Folsom, Dr. Glasgow

Equivalent: Entomology 4.

S 5. Insects of the Vegetable Garden.—Practical study of habits, development, and control of insects affecting vegetables. Text: Chittenden's *Insects Injurious to Vegetables*. T.W.T.F., 3, 4; 104 Vivarium. (2). Assistant Professor Folsom

Courses for Undergraduates and Graduates

S 2. Advanced Course.—Instruction to meet the purposes of the individual student. Arrange; 405 N.H. (2 or 3). Assistant Professor Folsom

S 8. Advanced Economic Entomology.—Assigned problems in economic entomology, to prepare advanced students for immediate service as state and government entomologists. Arrange; Ent. Building. (3). Assistant Professor Folsom

Prerequisite: 15 hours' credit in general and economic entomology.

Equivalent: Entomology 8.

S 6. Insects and Human Health.—Insects and their allies that cause or disseminate disease. Lectures; assigned reading; field observations; and practical demonstrations. The realtions of insects to the health of armies will be given special attention. (For pre-medical students, for prospective teachers of biology, and for students who may be interested in army sanitation or in municipal or state sanitary undertakings.) T.Th., 3, and one field excursion or demonstration weekly. Time to be arranged. (2). Dr. Glasgow

FRENCH

(See Romance Languages.)

GERMAN

Professor Lessing, Dr. Williams, Dr. Koller

S 1. Beginners' Course.—M.T.W.T., 8, 9, F. 9; 212 U.H. (4) Text: Gohdes and Buschek's *Sprach- und Lesebuch*. Dr. Koller

Unless ten students register, this course will not be given.

Equivalent: German 1.

S 4. Prose Reading.—Narrative prose; sight reading; composition. M.T.W.T.F.S., 8; 310 U.H. (3). Dr. Williams

Prerequisite: German 3.

Equivalent: German 4 (in part).

S 16. Composition and Conversation.—M.T.W.T., 9; 310 U.H. (2). Dr. Williams

Prerequisite: Two years of university German or an equivalent.

Equivalent: German 16.

S 25. Teachers' Course.—Place, aim, and scope of the study of German in the high school; methods; difficulties. Observation work in the beginners' course. T.T., 10; 212 U.H. (1). Dr. Koller

Prerequisite: Three years of university German or an equivalent.

Equivalent: One-half of German 25.

Courses for Undergraduates and Graduates

S 26b. History of German Literature Since the Reformation with Special Emphasis on the Classical Period.—Lectures; recitations; reports on assigned reading. M.T.W.T. 9; 215 L.H. (2). Professor Lessing

Prerequisite: Three years of university German or an equivalent.

Equivalent: German 26b (in part).

S 31. Elementary Middle High German.—Introduction to the German language and literature of the Middle Ages. M.W.F., 10; 215 L.H. (1½). Dr. Williams

Prerequisite: Three years of university German or equivalent.

Equivalent: German 31 (in part).

HISTORY

Professor Larson, Professor Randall

S 2. English History, 1713-1918.—The history of England since the Treaty of Utrecht. M.T.W.T.F., 8; 311 L.H. (2½). Professor Larson

Equivalent: History 2b (in part).

S 3b. American History, 1783-1861.—The National period to the Civil War. M.T.W.T.F., 10, 305 L.H. (2½). Professor Randall

Prerequisite: One year of college work or its equivalent.

Equivalent: History 3a (in part).

Courses for Undergraduates and Graduates

(At least junior standing is required.)

S 21. Recent American History, 1890-1918.—A special treatment of international relations will be combined with a study of domestic political problems. M.T.W.T.F., 11; 305 L.H. (2½). Professor Randall

Prerequisite: One college course in American history or its equivalent.

Equivalent: History 21 (in part).

S 40. The History of the British Commonwealth of Nations.—The expansion of England; imperial organization; the development of the colonial nations. M.T.T.F., 9; 311 L.H. (2). Professor Larson

Prerequisite: One college course in English or European history or its equivalent.

Equivalent: History 40.

Courses for Graduates Only

S 101. Seminar on War Problems.—War experience in the United States will be examined with special reference to the Civil War, and comparisons with present problems will be studied. Consideration will be given to such matters as the draft, punishment of treasonable activities, seizure of property, control of news, etc. Some attention will be given to economic and financial conditions. Time and credit to be arranged. Professor Randall

S 102. Studies in English History.—An introduction to the historical sources and literature of the sixteenth century through a detailed study of a few of the more important problems of the Tudor period. Time and credit to be arranged. Professor Larson

HORTICULTURE

Mr. Colby

S 1a Elements of Fruit Growing.—Principles of orcharding; the home orchard and small fruit garden from planting to bearing; orchard insects and diseases with methods of control. Selection of subject matter and methods of presentation considered for teachers' use. M.T.W.T. 8, 9; 122 Agr. (2) Mr. Colby

Equivalent: Horticulture 1a (in part).

S 1b. Elements of Vegetable Gardening.—Principles of vegetable growing; the laying out and planting of a garden with its subsequent care; storage of vegetables for winter. Selection of subject matter and method of presentation considered for teachers' use. T.W.T.F., 10, 11; 122 Agr. (2). Mr. Colby

Equivalent: Horticulture 1b (in part).

HOUSEHOLD SCIENCE

Miss MacKinnon, Miss Lamoreaux, Miss Bond

The work in Household Science, both in foods and clothing, is practically war work. It seems to the department an opportunity to be of real service to the people who have not had so much training in the schools but a very large practical experience.

Foods.—The work in foods is given under two divisions: (a) that in connection with the lunch room as a laboratory in which the principles of selection, preparation, and handling of foods in quantities are considered, and (b) that given in cooperation with and using the outlines prepared for college women by the United States Food Administration, with such modifications as local conditions make necessary.

S 7. **Institutional Cookery.**—Cooking in large quantities. The work includes the planning of meals and the selection and preparation of food in quantity. Opportunity is offered for practise in both cafeteria and table service. Lecture, T.T. 8; Laboratory, two three-hour periods, arrange; W.B. (2). Laboratory fee, $2.50. Miss Bond

Prerequisite: At least one year of experience in institutional or home cooking.

S 8. **Fundamentals of Food and Nutrition in Relation to the War.**—A general survey of the world's food problem in its geographic, economic, and nutritional aspects. Laboratory work in the use and conservation of foods. Laboratory, Sec. A., M.W.F., 10, 11; Sec. B., T.T.S., 8, 9; Lecture, T.T.; 11; Quiz, W.F., 8; W.B. (3). Laboratory fee, $2.00
Miss MacKinnon

Prerequisite: A year of general chemistry; a course in general physiology.

S 4. **Clothing.**—Textiles used in clothing; cost, care, and remodelling of clothing; use of patterns; drafting; the making of clothing. Lecture and discussion, M. 2; laboratory and demonstration, W.F., 1, 2, 3; W.B. (2). Miss Lamoreaux

Equivalent: Two-thirds of Household Science 12.

S 5. **Millinery.**—Design and construction of wire, buckram, and cape net frames; covering with velvet and straw. Demonstrations and laboratory. T.Th., 1, 2, 3; W.B. (1½).
Miss Lamoreaux

INDUSTRIAL EDUCATION

Professor Griffith

Courses will be offered in industrial education under the Smith-Hughes Act to experienced teachers in the grades or in the high school who have had at least two full years of successful trade experience in wood working or metal working beyond the apprenticeship stage or beyond the time when they began and continued to draw a journeyman's wage.

S 1. **Wood Working.**—Principles and practises of carpentery, cabinet making, and pattern making, together with the drawing and mathematics necessary in these trades. M.T.W.T.F., 2-5. (2 to 3). Professor Griffith

S 2. **Metal Working.**—The principles and practises of the machinist's and tool-maker's trade, together with mathematics, science, including metallurgy, and the drawing necessary in the prosecution of these trades. M.T.W.T.F., 2-5. (2 to 3). Mr. ————

S 3. **Industrial Education.**—A course for teachers preparing to teach in Smith-Hughes schools, dealing with the aims, objectives, and methods of industrial education and the operation of the Smith-Hughes Act. M.T.W., 11. (1½). Professor Griffith

For full information concerning these courses, write the Director of the Summer Session for the Vocational Education Bulletin.

LIBRARY SCIENCE

Director Windsor (in charge), Miss Bond, Miss Vought, Miss Alseth, Miss Cloud

S 1. **Classification, cataloging, book numbers.**—Including practise in classifying books according to the Dewey decimal classification, and the preparation of a dictionary catalog. M.T.W. T.F.S. 8. 30 hours Miss Vought

S 2. Reference work.—Study of the more important books of reference, and particularly those suited to the small public library. Twice a week. 12 hours Miss Bond

S 3. Selection of books.—The principles of book selection, with discussion of the literature of special subjects by members of the University faculty. 12 hours Miss Bond and others

S 4. Libraries and children.—Management of children's rooms; work with schools; selection of children's literature, illustrated by the use of a good collection of children's books. Twice a week. 12 hours Miss Cloud

S 5. Order, accession, etc.—Order, accession, shelf and loan records; trade bibliography; the checking of periodicals; mechanical preparation of books; mending and repair. Twice a week. 12 hours Miss Bond

S 6. Library administration and extension.—Lectures and round table discussions of library rules, accounts, finance, extension methods, and laws, and of buildings and equipment. Twice a week. 12 hours Miss Bond and others

MATHEMATICS

Associate Professor Shaw, Assistant Professor Sisam, Dr. Kempner, Dr. McAtee, Mr. Richardson, Mr. Steimley

The department began with the summer session of 1917 to offer at least five courses each summer for graduates and advanced undergraduates, and to vary these courses from year to year so as to enable advanced students to secure a suitable sequence of courses during four or five successive summer sessions. Three of these courses are of intermediate grade, being open to advanced undergraduates as well as to graduates, while the other two are primarily for graduate students. The intermediate courses given in the summer of 1917 were the following: Theory of equations and determinants, advanced calculus, and constructive geometry. Those which will complete the sequence in the summer of 1918 are the following: Advanced algebra, differential equations, and advanced analytic geometry.

The graduate courses offered in 1917 were: Introduction to group-theory and projective geometry. In the summer of 1918 this group will be continued by the courses following: Differential geometry, and vector methods. The descriptions of the courses will be found following. The courses are in many respects quite different from those having the corresponding titles and numbers in the regular sessions. They will aim to exhibit some of the characteristic elements of these fields and to emphasize the bearing of these subjects on the more elementary developments of mathematics. Teachers of mathematics will find the summer courses particularly adapted to their needs.

Mathematics Library and Models

The Mathematics Library now contains more than 6,000 volumes. Fifty current mathematical periodicals are received in addition to a large number of serials devoted partly to mathematics and available in the general Library. The Mathematics Library will be open to all students during certain hours of each day except Sunday, but graduate students in mathematics can secure keys which will enable them to use this library whenever the outside doors of the Natural History Building, in which it is located, are open.

A large collection of mathematical models is exhibited in cases located in the halls adjoining the mathematics recitation rooms and in the Mathematics Reading Room. This collection includes models relating to the following subjects: Quadratics of all kinds, surfaces of the third and fourth order, surfaces of higher orders and line geometry, curves in space, differential geometry, descriptive and projective geometry, analysis situs, mechanics and kinematics. It also includes devices and machines for mechanical computation, integration, and harmonic analysis.

The Mathematics Club will meet every Friday at 4 p.m. in Room 434, Natural History Building, for the consideration of mathematical questions of general interest, especially questions relating to the teaching and the history of mathematics. These meetings will be open to all the students who may be interested and will usually last for an hour.

Courses for Undergraduates

S 2. College Algebra.—Text: Rietz and Crathorne's *College Algebra*. M.T.W.T.F.S., 10; 422 N.H. (3). Mr. Steimley

Prerequisite: Two and one-half units entrance mathematics.

Equivalent: Mathematics 2.

S 4. Plane Trigonometry.—Text: Taylor's *Trigonometry*. M.T.W.T.F., 11; 434 N.H. (2). Mr. Steimley

Prerequisite: Two and one-half units entrance mathematics.

Equivalent: Mathematics 4.

S 6. Analytical Geometry.—Introductory plane and solid analytic geometry. Text: Wilson and Tracey's *Analytic Geometry*. M.T.W.T.F. 10 and 11; 418 N.H. (5). Mr. Richardson

Prerequisite: Mathematics 2 and 4.

Equivalent: Mathematics 6.

S 7. Differential Calculus.—Course for beginners. Text: Townsend and Goodenough's *Essentials of Calculus*. M.T.W.T.F., 8 and 9; 425 N.H. (5). Dr. McAtee

Prerequisite: Mathematics 6.

Equivalent: Mathematics 7.

S 9. Integral Calculus.—Text: Townsend and Goodenough's *Essentials of Calculus*. M.T.W.T.F.S., 10; 419 N.H. (3). Dr. Kempner

Prerequisite: Mathematics 7.

Equivalent: Mathematics 9.

Courses for Advanced Undergraduates and Graduates

S 12. Advanced Algebra.—Selected topics from higher algebra, such as permutations, combinations, probabilities, determinants with applications, graphical methods, continued fractions, fundamental theorem of algebra. Text: Fine's *College Algebra*. M.T.W.T.F., 9; 418 N.H. (2½). Dr. Kempner

Prerequisite: Mathematics 7-9.

Equivalent: Mathematics 10 (in part).

S 16. Differential Equations.—Total and partial differential equations. Applications to geometry and physics. Special study of linear equations, and in particular certain forms that appear frequently in physics. Text: Cohen's *Differential Equations*, with references to Hedrick's translation of Goursat's course in Analysis. M T W.T F.S., 11; 419 N.H. (3). Associate Professor Shaw

Prerequisite: Mathematics 7-9.

Equivalent: Mathematics 16.

S 19. Solid Analytic Geometry.—Equations of the plane and right line in space, classification of quadrics. Special properties of quadrics. Text: Snyder and Sisam's *Analytic Geometry of Space*. M.T.W.T.F., 8; 422 N.H. (2½). Assistant Professor Sisam

Prerequisite: Mathematics 10.

Equivalent: Mathematics 19.

Courses for Graduates Only

S 135. Differential Geometry.—Applications of calculus to the theory of space curves and surfaces; loci associated with a given curve or surface; relation of the theory of surfaces to the invariants of a pair of quadratic forms. M.T.W.T.F., 10; 422 N.H. (1 unit). Assistant Professor Sisam

Prerequisite: Mathematics 16 or registration in 16.

S 141. Vector Methods.—An application of the algebras of quaternions, space analysis, and dyadics; differentials and integrals in space; applications to geometry, mechanics, physics, and meteorology. M.T.W.T.F., 8; 418 N.H. (1 unit). Associate Professor Shaw

Prerequisite: Mathematics 16-17.

Equivalent: Mathematics 141.

MECHANICS, THEORETICAL AND APPLIED

Professor Moore, Assistant Professor Seely, Mr. Putnam

S 20. Analytical Mechanics.—The first half of analytical mechanics as given in Maurer's *Technical Mechanics*. M.T.W.T.F.S., 10; 202 E.H. (3). Assistant Professor Seely

Prerequisite: Mathematics 7 and registration in Mathematics 9.

S 21. Analytical Mechanics.—The second half of analytical mechanics as given in Maurer's *Technical Mechanics*. T.W.T.F., 1; 202 App. Mech. Lab. (2). Assistant Professor Seely

Prerequisite: Mathematics 9. and Theoretical and Applied Mechanics 20.

S 25. Resistance of Materials.—The mechanics and properties of materials used in construction; experiments in the testing laboratory; problems. Merriman's *Mechanics of Materials*. M.T.W.T.F.S., 11; 202 E.H.; M.W., 8-10; App. Mech. Lab. (4). Mr. Putnam

Prerequisite: Mathematics 9, and Applied Mechanics 20.

Courses for Graduates and Advanced Undergraduates

S 41. Advanced Mechanics of Materials.—Special advanced problems, such as flat plates, flexure of unsymmetrical sections, curved beams, hooks, rings, thick cylinders. Lectures, assigned reading, and computing room periods, T.W.T.F. 8-10, 302 App. Mech.; Lab. (3). Assistant Professor Seely

S 42. The Properties of Engineering Materials; Specifications and Inspection.—Properties and uses of the materials of construction, steel, and iron, non-ferrous metals, wood, concrete, brick, stone. Standard specifications for materials, and methods of inspection. Lectures and assigned reading. M.T.W.T.F.S., 10; 302 App. Mech. Lab. (2). Professor Moore

S 43. Laboratory Work in Testing Materials.—Study of testing machines and strain measuring apparatus; practise in making standard tension, compression, flexural, and torsion tests. Impact tests, repeated stress tests, hardness tests, and tests of special forms. Study of systematic tabulation and reduction of test data. Laboratory and computing room periods. M.T.T.F., 1-5; 302 App. Mech. Lab. 3. (3). Professor Moore and Mr. Mutnam

MUSIC

(For fees, see page 9.)

Director Erb, Miss Treat, Mr. Swinney

S 1a. Musical History.—Biography, including critical discussions of important compositions, and the investigation of national tendencies in modern music. Collateral reference work and note books are required. M.T.W.T., 9; 126 U.H. (2). Director Erb

Prerequisite: The consent of the instructor and Music S 1.

Equivalent: Music 2.

S 2a. Advanced Harmony.—The chromatic harmonies; diatonic and chromatic modulation; sequences; suspensions; figured bass playing; harmonization with four clefs; harmonic analy sis continued. T.T. 4, 126 U.H. (1). Director Erb

(This course will not be given unless five students register for it).

Prerequisite: One and one-half years harmony

Equivalent: Music 5.

S 3a. Harmony.—The septchords: including dominant and secondary sevenths, also the dominant ninth; harmonization with three clefs on four staffs; sequences; study of key relations and simple diatonic modulations; harmonic analysis commenced; keyboard work. M. T.W.T., 10; 126 U.H. (2). Director Erb

Prerequisite: One semester in harmony.

Equivalent: Music 4.

S 6a. Public School Music Methods.—Problems of supervision in the grades; sight-singing; ear-training; study of material; music appreciation. M.T.W.T., 11, 126 U.H. (2). Mr. Swinney

Prerequisite: 2 years of sight reading and the consent of the instructor.

Equivalent Music 25a (in part)

S 41a-41f. **Preparatory Course in Piano.**—Arrange hours; 102 U.H. no university credit. Miss Treat

Prerequisite: The consent of the instructor.

Equivalent: Music 41a-41f (in part).

S 42-46. **Piano, Collegiate Grade.**—Arrange hours; 102 U.H. (1 or 2). Miss Treat

Prerequisite: Three years of piano study.

Equivalent: Music 42-46 (in part).

S 47. **Piano, Collegiate Grade.**—For students in other schools and colleges of the University. Arrange hours; 102 U.H. (1). Miss Treat

Prerequisite: Three years of piano study.

Equivalent: Music 47 (in part).

S 51a-51f. **Preparatory Course in Voice.**—Arrange hours; 101 U.H. no university credit. Mr. Swinney

Prerequisite: The consent of the instructor.

Equivalent: Music 51a-51f (in part).

S 52-56. **Voice, Collegiate Grade.**—Arrange hours; 101 U.H. (1 or 2). Mr. Swinney

Prerequisite: Three years of vocal study.

Equivalent: Music 52-56 (in part).

S 57. **Voice, Collegiate Grade.**—For students in other schools and colleges of the University. Arrange hours; 101 U.H. (1). Mr. Swinney

Prerequisite: Three years of vocal study.

Equivalent: Music 57 (in part).

S 81. **Organ.**—Arrange hours; 121 U.H. (1). Miss Treat

Prerequisite: Three years of piano study or the equivalent.

Equivalent: Music 81 (in part).

S 82. **Organ.**—For students in other schools and colleges of the University. Arrange hours; 121 U.H. (1). Miss Treat

Prerequisite: Three years of piano study or the equivalent.

Equivalent: Music 82 (in part).

Students desiring to take organ will be obliged to pass without conditions the entrance examination for collegiate standing in piano.

Campus sing every Wednesday evening at 6:45, Auditorium steps

PHILOSOPHY

Professor Daniels

S 9. **Political and Social Ethics.**—A study of the standards and principles of human conduct in political and social relations. Rights and duties of the state and the citizen. International morality. M.T.T.F., 8; 117 L.H. (2). Professor Daniels

Prerequisite: Two years of university work or the equivalent.

PHYSICAL TRAINING FOR MEN

Director Huff, Mr. Zuppke, Mr. Gill, Mr. Jones, Mr. Schuettner

S 10. **Baseball.**—Theory and practise in batting; base running; proper methods of fielding each position; team work and coaching methods; study of the rules; physical condition; methods of indoor practise. Lectures and practical work. M.T. 10-12, W.T. 8-10. (1½). Director Huff

S 11. **Track and Field Athletics.**—Instruction and practical demonstration in starting, sprinting, distance running, hurdling, high and broad jumping, pole vaulting, shot putting, hammer throw, and discus; practical talks on methods of preparing contests for different athletic events; adaptions to individual peculiarities; rules of competition; study of physical condition, including endurance, speed fatigue, and all means training for condition; work assigned for the promotion, management, and officiating of games and meets. Lectures and practical work. W.T.F.S., 10-12. (1½). Mr. Gill

S 12. Basketball.—Instruction will be given in basketball with the idea of fitting men to coach. The course will cover passing, goal throwing, dribbling, team play, how to condition a team, and the different styles of play used by the leading coaches. Lectures and practical work. M T.W.T.,. 1-3. (1½). Mr. Jones

S 13. Football.—The theoretical work will take up the rules from the standpoint of coach, players, and officials; the several styles of offense and defense with consideration of their special strengths and weaknesses; generalship and strategy. The practical work will include: training, conditioning, and player's equipment; punting, drop kicking, place kicking, kick off, and forward passing; tackling dummy and charging sled; special drills for linemen, ends, and backs; following the ball, interference, and team work; fundamental plays, freak plays, and signal systems. Lectures and practical work. M.T.F.S., 8-10. (1½). Mr. Zuppke

S 14. Training.—Theories of training, massage, treatment of sprains, bruises, etc.; bandaging and first aid. Lectures and practical work. This course should be taken by all who take S 10, S 11, S 12, or S 13. F.S., 1. (½). Mr. Jones

S 15. Calisthenics.—Typical lessons for corrective and responsive work. Instruction will be given in free exercises. The course will cover the use of wands, Indian clubs, and dumb-bells.

(a) Practise and instruction by demonstration and command. Emphasis to be laid on progression and exactness of execution.

(b) Theoretical work. Practise teaching. M.F. 3, T.W. 4. (⅓). Mr. Schuettner

S 17. Elementary Gymnastics.—Theory and practise in elementary exercises on heavy apparatus, mats, horse, horizontal bar, rings, and parallel bars. Accuracy of form and execution emphasized. The chief purpose is to teach a large variety of rapid mass work adapted to the average class. T.W.T. 3, F. 2. (½). Mr. Schuettner

S 18. Intermediate Heavy Gymnastics.—More advanced work along the same lines as course S 17. The laws of gymnastic progression will be emphasized. Nomenclature and analysis of exercises, and the use of heavy apparatus. T.W.T. 3, F. 2. (½). Mr. Schuettner

S 19. Advanced Gymnastics.—Heavy apparatus. Advanced exercises on heavy apparatus; nomenclature; skill, form, and accuracy of execution emphasized. T.W.T. 3, F. 2. (½). Mr. Schuettner

S 21. Gymnastic Dancing.—(a) Elements of steps, simple steps, and series of dancing steps to be given to classes in single file, pairs, and in open order. (b) Practise teaching and more advanced steps. M.Th.F. 4, Tu. 5. (½). Mr. Schuettner

S 23. School Room Gymnastics.—The possibilities of exercise for elementary grades and high school will be shown. Exercises suitable for schoolroom. Practise teaching. M.F. 3, T.W. 4. (⅓). Mr. Schuettner

PHYSICAL TRAINING FOR WOMEN

Miss Freer and Miss————

S 1. Principles and Methods of Physical Training—Lectures and practise. M.T.W.T.F. 2; (1)

S 2. Folk Dance and Singing games— M.W.F. 3. (½).

S 3. Community Recreation—Lectures and practise. T.T.F. 10. (½).

S 4. Swimming—Instructions in small groups. M.T.W.T.F. 11, 2. 3, 4. (No credit).

PHYSICS

Professor Watson (in charge), Dr. E. H. Williams, Mr. Karrer, Mr. Hill, Mr. Stevenson

S 7I. General Physics, Part I.—Mechanics; motion; forces and their effects; equilibrium. Text: Kimball's *College Physics*. M.W.F., 11: Lecture Room 119, Physics. (1½). Professor Watson, Mr. Stevenson

Prerequisite: Plane geometry and high-school algebra; registration in Physics S 81. Plane trigonometry desired.

Equivalent: S 7 (I, II, III) together with S 8 (I, II, III) are equivalent to Physics 7a-7b, 8a-8b for the college year.

S 8I. Introductory Laboratory Physics, Part I.—Physical measurements on mechanics, properties of matter, to accompany S 7I. Text: Schulz's *Laboratory Manual*. M.W.F., 2-4; 212 Physics. (1½). Mr. Karrer, Mr. Hill

Prerequisite: Registration in Physics S 7I.

Equivalent: See S 7I.

S 7II. General Physics, Part II.—Electricity and magnetism. Text: Kimball's *College Physics*. M.W.F., 10; Lecture Room 100, Physics. (1½). Dr. Williams, Mr. ————

Prerequisite: See S 7I.

Equivalent: See S 7I.

S 8II. Introductory Laboratory Physics, Part II.—Laboratory to accompany S 7III Text: Schulz's *Laboratory Manual*. T.T., 2-4, S., 8-10; 212 Physics. (1½)
Dr. Williams, Mr. Stevenson

Prerequisite: Registration in S 7II.

Equivalent: See S 7I.

S 7III. General Physics, Part III.—Heat, light, and sound. Text: Kimball's *College Physics*. T.T.S., 11; Lecture Room 100, Physics. (1½). Professor Watson, Mr. Stevenson

Prerequisite: Same as S 7I.

Equivalent: See S 7I.

S 8III. Introductory Laboratory Physics, Part III.—Laboratory to accompany S 7III. Text: Schulz's *Laboratory Manual*. Either at M.W.F., 2-4, or T.T., 2-4, S, 8-10; 212 Physics. (1½).
Mr. Karrer, Mr. Hill

Prerequisite: Registration in Physics S 7III.

Equivalent: See S 7I.

S 4. Electrical and Magnetic Measurements.—Discussions, recitations, and reports. 4 3-hr. laboratory periods, arrange; 112 Physics. (2). Mr. Karrer

Prerequisite: A course in general physics and calculus.

Equivalent: First semester of Physics 4.

S 16. Heat.—Fundamental heat phenomena; thermometry; calorimetry; expansion; vapor pressure. Text: Edser's *Heat for Advanced Students*. W.F., 8 W., 2-4; 213 Physics. (1½).
Dr. Williams, Mr. Stevenson

S 18. Teachers' Course.—(1) Discussions of methods of organizing laboratory work; quizzes; demonstrations; criticisms of high school text-books; principles of selecting and ordering apparatus. (2) Practical laboratory manipulation; glass blowing, minor repairs of apparatus, preparation of direction sheets, etc. T.T.,8; 208; Physics. (1). Professor Watson

S 21. Recent Advances and Applications in Physics.—Popular experimental lectures on recent advances and applications of physics. Applications which affect our present war conditions will be given special consideration. The lectures will be public and may be attended by those interested. One-half hour credit may be obtained by presenting brief abstracts of the lectures, and by writing a short examination on the main facts presented. The topics and dates of lectures will be announced later. Tu. 4; Physics Lecture Room, 100 Physics. (½).
Professor Watson, and Mr. Karrer in charge

Courses for Undergraduates and Graduates

S 31. Special Problems in Advanced Physical Measurements.—Arrange time. (1 or 2).
Professor Watson, Dr. Williams

Prerequisite: A course in general physics, calculus.

Courses for Graduates Only

S 126. Physics Colloquium.—Biweekly meetings of the instructors and advanced students of the department for the presentation and discussion of papers on current problems. Attendance is expected of all graduate students. Undergraduates who are especially interested in physics as teachers or otherwise, are advised to attend. Thursday, 4 p. m.; 201 Physics Building.
Professor Watson, Mr. Karrer

S 131. Investigation of Special Problems.— Professor Watson, Dr. Williams

S 133. Seminar and Thesis.— Professor Watson

POLITICAL SCIENCE

Dr. Cushman

S 1. American National Government.—Historical development, organization, powers, limitations, and practical working of the national government. M.T.W.Th.F., 2. (2½).
Dr. Cushman

Prerequisite: Thirty hours of university work or the consent of the instructor.

Equivalent: Political Science 1 (in part).

S 11. Social Problems and the Constitution.—The power of the state and nation to legislate concerning the public health, morals, safety and general welfare; labor legislation; control of trusts and monopolies. M.T.W.Th.F., 3. (2½). Dr. Cushman

Prerequisite: Six hours of political science or economics or the consent of the instructor.

Equivalent: Political Science 11 (in part).

PSYCHOLOGY

(See also Education.)

Assistant Professor Ruckmich

S 1. Introduction to Psychology.—The facts and laws of mind. Sensation and image, perception, attention, memory, emotion, action, and thought. Lectures, illustrated with experimental demonstrations, and discussions, M.T.W.T.F. 10; 410 U.H. (2½).
Assistant Professor Ruckmich

Prerequisite: Sophomore standing or consent of the instructor.

Equivalent: Psychology 1 (in part).

S 3. Elementary Laboratory Practise.—The standard experiments in the fields of sensation, feeling, attention, perception, memory and association, and action. A drill course in introspection under experimental control. M.W.F., 8-10; 507 U.H. (1½).
Assistant Professor Ruckmich

Prerequisite: Sophomore standing or consent of the instructor; registration in S 1 or previous instruction in its equivalent is desirable.

Equivalent: Psychology 3 (in part).

S 18. Psychological Problems of the War.—Problems of especial significance in connection with the war and the result of investigations made with reference to military conditions, such as: the selection and classification of recruits, the localization of sound, the examination of the peculiar effects of high altitudes on memory, the rehabilitation of disabled soldiers, the study of psychopathological cases, and the discussion of phases of social psychology. Lectures and discussions. T.T., 8; 208 U.H. (1). Assistant Professor Ruckmich

S 21. Special Studies.—Individual investigations, for advanced students, in the form of essay or experiment. Some small problem will be offered for investigation in a field in which the student is interested and opportunity will be afforded to gain practise in observing other researches under way. Hours to be arranged; 507 U.H. (1-2). Assistant Professor Ruckmich

Prerequisite: The equivalent of psychology 1 and consent of the instructor

Equivalent: Psychology 21, or in part.

PUBLIC HEALTH AND SANITATION

Dr. Beard

These courses are especially designed for the instruction of health nurses, social workers teachers, and other persons who may be called on for community leadership in organizing or taking part in the promotion of public health and sanitation. They are of a practical character and arranged to emphasize the relations of public and personal hygiene, and of sanitation to the welfare of society

S 1. Public Health and Prevention of Disease.—The cause, manner of dissemination, and method of control of communicable disease. Lectures and demonstrations. Investigation of special problems. M.W.F., 8. (1½). Dr. BEARD

S 2. Sanitary Organization and Inspection.—Sanitary inspections, health surveys, public health organization, health administration. Lectures and field work. T.Th.S., 8. (1½). Dr. BEARD

S 3. First Aid and Medical Emergencies.—Lectures, demonstrations, and practical work. This course is designed to meet the requirements of the Red Cross certificate. Four weeks, beginning June 17. (If there is sufficient demand, this course will be repeated during the second month of the Summer Session). M.T.W.Th., 2. (1). Dr. BEARD

S 4. Home Nursing.—General care of a patient; simple sick-room appliances; standard surgical supplies and bandages (Red Cross); bandaging. Four weeks beginning June 17. Lecture with demonstration, M.Tu., 3; Laboratory W.F., 3, 4; W.B. (1). Miss ————

ROMANCE LANGUAGES

Professor FITZ-GERALD, Dr. GILLET, Mr. LOPEZ

Methods of Teaching

French S 25 or Spanish S 25. Methods of Teaching Modern Languages.—Discussion of practical problems. During a portion of the time the class will be divided into two sections, for French and Spanish respectively. T.T., 10; 117 L.H. (1).

Professor FITZ-GERALD, with the cooperation of Dr. GILLET

French

S 1a. Elementary Course.—Pronunciation, grammar, reading of easy texts. David, *Chez nous*. M., 9; T.W.T.F., 8, 9; 117 L.H. (4) Dr. GILLET

Equivalent: French 1a, or one year of high-school French.

S 2a. Composition, Conversation, Reading of Modern Authors.—Weill, *French Newspaper Reader*. W.F.; 10; 211 L.H. (1) Dr. GILLET

Prerequisite: One year of college French, or the consent of the instructor.

Course for Advanced Undergraduates and Graduates

S 22. Nineteenth Century Fiction and Drama.—M.W., 10; 117 L.H. (1). Professor FITZ-GERALD

Prerequisite: Three years of college French or the consent of the instructor.

Spanish

S 1a. Elementary Course.—Pronunciation, grammar, reading of easy texts. Hills and Ford, *First Spanish Course*. M., 9; T.W.T.F.S., 8, 211 L.H. (4). Mr. LOPEZ

Equivalent: Spanish 1a, or one year of high-school Spanish.

S 2a. Second-year Spanish.—Reading of modern authors, review of the grammar, conversation. M.T.W.T., 11; 117 L.H. (2). Professor FITZ-GERALD

Prerequisite: One year of college Spanish, or the consent of the instructor.

Course for Advanced Undergraduates and Graduates.

S 22. Nineteenth Century Fiction and Drama.—T.T., 9; 212 L. H. (1). Professor FITZ-GERALD

Prerequisite: Three years of college Spanish, or the consent of the instructor.

SOCIOLOGY

Dr. Stevens, Mr. Dennis

S 1. The Principles of Sociology and Their Application to Present Problems.—W.T., 8; 306 L.H. (2). Mr. Dennis

Prerequisite: Junior standing, or equivalent.

Equivalent: Sociology 1 (in part).

S 9. Criminology.—Nature, causes, results, and treatment of crime in the light of modern biological, psychological, and sociological facts. Study of institutional and administrative methods for the treatment of crime and the social measures proposed for its prevention. T. W.T.F.,11; 306 L.H. (2). Dr. Stevens

Prerequisite: Senior standing or its equivalent.

Equivalent: Sociology 9 (in part).

S 18. Emergency Relief.—Presentation of the problems caused by fire, flood, war, and other disasters or by sudden social maladjustments, affecting health, child welfare, family reorganization, emergency housing, re-education and readjustment of the crippled and disabled. Study of the agencies and principles of treatment including: the Red Cross, the charity organization society, governmental organizations, and the fundamental methods of home service and case work. 9-10 T.W.T.F., 306 L.H. (2). Dr. Stevens

Prerequisite: Consent of the instructor.

S 19. Projects for Social Reform.—Historical and critical survey of projects for social reform, from the seventeenth century utopias to contemporary revolutionary schemes and legislative programs. Measures for improvement of the agencies of social control. M.T.W.T., 10; 306 L.H. (2). Mr. Dennis

Prerequisite: Consent of the instructor.

SPANISH

(See Romance Languages.)

ZOOLOGY

Dr. Van Cleave, Dr. Faust, and Assistant

Courses for Undergraduates.

S 1. General Zoology.—Animal biology, principles of structure, function, interrelations, origin, and development of animal life; simpler and best-established generalizations in zoological theory. 12 hours a week laboratory, 6 hours a week lectures and recitations. (5). Dr. Van Cleave and Assistant

Equivalent: Zoology 1.

S 2. Vertebrate Zoology and Comparative Anatomy.—Classification of the Chordata; early stages of vertebrate embryology; structure of vertebrate tissues; anatomy of systems of organs considered in respect to their function, ontogeny, and evolution in the vertebrate series; anatomical studies of types of Chordata. 12 hours a week laboratory, 6 hours a week lectures and recitations. (5) Dr. Faust and Assistant

Prerequisite: Zoology 1 or its equivalent.

Equivalent: Zoology 2.

S 27. Essentials of Laboratory Technic.—Instruction in collection of zoological materials and their preparation for use, including preserving, sectioning, staining, and mounting. 4 hours a week of laboratory and lectures. (1). Dr. Faust

Prerequisite: One semester of college zoology.

S 19. Teachers' Course.—The relation of life sciences to other subjects; their educational value; application of the scientific method to the teaching of biology; the values of library, classroom, field, and laboratory for the high-school course; outline of courses; analysis of texts; methods of collecting and preserving materials for class use. 2 hours a week; lectures, discussions, and assignments. (1). Dr. Van Cleave

Prerequisite: One semester in college zoology or botany or one year's experience teaching biology in an accredited school.

LEARNING AND LABOR

University of Illinois

SUMMER SESSION, 1919

GENERAL ANNOUNCEMENTS
FACULTY AND COURSES

JUNE 24 TO AUGUST 16, 1919

(For candidates for masters' degrees, 9 weeks; for courses in physical education and library science, 6 weeks.)

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UNIVERSITY OF ILLINOIS

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JOHN ALFORD STEVENSON, PH.D., *Director of the Summer Session.* 203 *University Hall*
CHARLES MAXWELL MCCONN, A. M., Registrar, 156 Administration Building
LLOYD MOREY, A. B., B. Mus., C. P. A., Comptroller

Calendar

Summer Session, 1919

June 24, Tuesday—Registration Day.
August 15 and 16, Friday and Saturday—Final Examinations.

First Semester, 1919-1920

September 15 to 19, Monday to Friday—Entrance Examinations
September 22 and 23, Monday and Tuesday—Registration Days
September 24, Wednesday, 8 a. m.—Instruction Begins

Growth and Registration of Students

ALL DEPARTMENTS

'94-'95	810
'90-'00	2225
'04-'05	3734
'09-'10	5118
'14-'15	5956
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'16-'17	6828
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SUMMER SESSION, 1919

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Ralph R. Jones, *Associate in Basketball*
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Armin Hajman Koller, Ph.D., *Instructor in German*
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Claude Jerome Lapp, A. B., *Assistant in Physics*
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Robert Carl Zuppke, Ph.B., *Associate in Football*

GENERAL STATEMENT

Location of the University of Illinois

The University of Illinois is situated in Champaign County in the eastern central part of the state between the cities of Urbana and Champaign, and within the corporate limits of the former. It is one hundred and twenty-eight miles south of Chicago, on the main Chicago-New Orleans line of the Illinois Central, the station being Champaign. The Wabash and the Cleveland, Cincinnati, Chicago & St. Louis ("Big Four" of the New York Central Lines) railroads have stations in both cities. The cities of Urbana and Champaign have together a population of 29,000.

The institution was incorporated February 28, 1867, under the name of the Illinois Industrial University. It was not until 1885 that the Legislature changed the name to the University of Illinois.

Buildings and Grounds

The land occupied by the University and its several departments embraces about two hundred and thirty-eight acres, besides a farm of about nine hundred ninety acres. The buildings at Urbana are fifty-one in number, chief of which are the Agriculture Building, Agronomy Buildings, Armory, Astronomical Observatory, Auditorium, Beef Cattle Building, Central Heating Station, Chemistry Laboratory, Physics Laboratory, Physics Laboratory, Electrical Engineering Laboratory, Engineering Hall, Lincoln Hall, Farm Mechanics Building, Horticulture Building, Law Building, Library Building, Laboratory of Applied Mechanics, Mechanical Engineering Laboratory, Men's Gymnasium, Metal Shops, Natural History Building, Pumping Station, University Hall, Woman's Building, Wood Shop, Foundry, Commerce Building, Transportation Building, Gymnasium Annex, Stock Pavilion, Administration Building, Vivarium Building, Ceramics Building, and the College of Education Building. The Smith Memorial Music Building is nearing completion.

Libraries

The University library, at Urbana, contains 408,000 volumes, and receives over 3,000 periodicals; the current numbers of many of these periodicals are kept in the public reading room. The library of the State Laboratory of Natural History contains 10,200 volumes and 50,000 pamphlets.

The library is housed, for the most part, in the library building, and is for the use of the whole University. All students have the direct use of 10,700 volumes in the reading rooms, and in addition graduate and advanced students have the use of the seminar libraries. Twenty-one seminar and departmental collections are maintained in various buildings on the campus, including the six seminars in Lincoln Hall.

The Summer Session

The Summer Session of the University of Illinois for 1919 will open on June 24, and close on August 16, making a term of *eight weeks,* or one-half a semester, for all students except graduate students who are candidates for a master's degree, for whom the prescribed term is *nine* weeks, and except students taking only courses in library science, physical education for men, or athletic coaching, for whom the term is *six* weeks from June 24. The opening day will be devoted to registration. The final examinations will be held on Friday and Saturday of the last week.

All of the courses, except those in library science and physical education for men, will extend through the eight weeks. Students who wish to remain for only six weeks, however, may obtain from the Director of the Summer Session a certificate for such

attendance, but university credit will not be given for six-weeks' courses, except for those in physical education for men and in athletic coaching.

The number of semester hours which may be earned in each course is stated in the descriptive outline given later in this announcement. Students may register for courses aggregating eight hours or less.

Purpose

The Summer Session is an organized integral part of the University year. Though its organization is not subdivided into colleges, numerous courses are offered by departments in the Colleges of Liberal Arts and Sciences, Commerce, Agriculture, Engineering, and in the School of Music and the Library School. All courses may be counted toward an A.B. or B.S. degree, or toward a master's degree, unless otherwise specified. By two Summer Sessions a regular student may reduce the eight semesters to seven, thus securing his degree a half year earlier than he would otherwise have done.

Students who have just graduated from an accredited high school may matriculate in the Summer Session and obtain credit for a half-semester. Pre-medical students are strongly urged to do this and to register for chemistry or zoology, mathematics, rhetoric, or other prescribed pre-medical subjects.

One of the primary purposes of the Summer Session is to meet the needs of the teachers in the public schools who wish to spend a part of the summer vacation in serious study or investigation. Numerous courses are designed particularly for high school teachers, supervising officers, teachers of special subjects (agriculture, art, household science, manual training, music, industrial education, etc.), and coaches of athletic teams; graduate courses are offered for college instructors, school supervisors, and principals who are working for advanced degrees.

Admission

Admission in regular status to courses in the Summer Session for which university credit is granted is limited to students who could be regularly admitted into the colleges of the University (Liberal Arts and Sciences, or Commerce, or Engineering, or Agriculture) in which they would be registered in the winter session.

In order to meet in full the entrance requirements for any one of these colleges, a student must be a graduate of an accredited high school (or in lieu of such graduation, must pass entrance examinations in five units, including English composition, 1; algebra, 1; and three others to be designated by the University authorities in each case), and must obtain credit, either by passing entrance examinations or by presenting certificates of work completed in accredited secondary schools or other recognized schools, for 15 units of high-school work, or the equivalent, in subjects accepted for admission to the University, including in the case of each college certain subjects especially prescribed for admission to that college.

(1) The subjects prescribed for admission to the *College of Liberal Arts and Sciences,* for the *General Curriculum,* the *Curriculum in Journalism,* and the *Pre-Legal Curriculum,* are: English, 3 units; algebra, 1 unit; plane geometry, 1 unit; laboratory science, 1 unit; Latin, Greek, French, German, or Spanish, 2 units (both units in the same language). Seven elective units are required to make up the total of 15 units.

(2) For the *College of Liberal Arts and Sciences,* for the curriculums in *Household Administration* and for *Household-Science Teachers,* the prescriptions are the same as in paragraph 1, except that the laboratory science, 1 unit, must be physics. (See also paragraph 7.)

(3) For the *College of Liberal Arts and Sciences,* for the *Pre-Medical Curriculum,* the prescribed subjects are: English, 3 units; algebra, 1 unit; plane geometry, 1 unit; laboratory science, 1 unit; Latin, Greek, French or German, 2 units (both units in the same language); history or civics, 1 unit. Six elective units are required to make up the total of 15 units.

(4) For the *College of Liberal Arts and Sciences,* for the curriculums in *Chemistry* and *Chemical Engineering,* the prescribed subjects are: English, 3 units; algebra, 1 unit; plane geometry,

1 unit; laboratory science, 2 units; German or French, 2 units (both units in the same language). Six elective units are required to make up the total of 15 units.

(5) For the *College of Engineering,* the prescribed subjects are: English, 3 units; algebra, 1½ units; plane geometry, 1 unit; solid and spherical geometry, ½ unit; laboratory science, 1 unit. Eight elective units are required to make up the total of 15 units.

(6) For the *College of Agriculture,* for the *agricultural curriculums,* the prescribed subjects are: English, 3 units; algebra, 1 unit; plane geometry, 1 unit; laboratory science, 2 units. Eight elective units are required to make up the total of 15 units.

(7) For the *College of Agriculture,* for the curriculum in *Household Science,* the prescribed subjects are the same as in paragraph 6 except that one of the units of laboratory science must be physics.

(8) For the *School of Music,* the prescribed subjects are: English, 3 units; algebra, 1 unit; plane geometry, 1 unit; laboratory science, 1 unit; Latin, Greek, French, German or Spanish, 2 units (both units in the same language); music, 2 units. Five elective units are required to make up the total of 15 units.

(9) Students who can meet the prescriptions for any of the other colleges as outlined above may be admitted to the *College of Commerce and Business Administration.*

Admission to courses which give university credit, as *special students, not candidates for a degree,* may be granted to persons 21 years of age or over, subject to the general regulations of the University relating to special students.

A student who transfers from another college or university must present a letter of honorable dismissal, and transcript of record, from the institution previously attended.

Registration

Students will present themselves for registration on Tuesday, June 24. *The registration offices will be in the Library Building.* A representative of each department offering Summer Session courses will be present throughout the day. Students will consult with these representatives regarding the courses for which they wish to register. The study blanks will then be filled out, submitted to the Director for approval, and filed with he Registrar.

Students who wish to register for advanced degrees will first secure their study-lists at the Registrar's office, 156 Administration Building.

Fees

All fees are due upon registration.

A tuition fee of twelve dollars ($12) is required of all students in regular attendance at the Session. This entitles one to admission to regular courses and to all special lectures. It also entitles one to one lesson per week of music or collegiate grade. An extra laboratory fee is charged in some courses for materials used. Any single course, counting not more than two and one-half credit hours, may be taken for a fee of six dollars ($6) and the laboratory fee, if there be any in connection with the course taken.

Fees in addition to the tuition fee are required for special work in music, except as just noted. These are comparable with the fees charged for similar work in regular semesters:

Two lessons per week in piano, voice, or in organ of collegiate grade	$12.00
One lesson per week in piano or voice of preparatory grade	5.00
Two lessons per week in piano or voice of preparatory grade	8.00
Use of piano for one hour per day for two months	1.50
Use of organ for one hour per day for two months	10.00
Use of organ for one-half hour per day for two months	5.00

Scholarships

By a ruling of the Board of Trustees of the University, all high-school teachers in Illinois, and all other teachers in the State who are qualified to matriculate in the

University as regular students, are entitled to Summer Session scholarships, exempting them from payment of the tuition fee. To matriculate regularly in the University, one must satisfy in full the entrance requirements for some one of the colleges as outlined on page 9.

By a more recent resolution of the Board of Trustees, the scholarship privilege is extended to graduates of the Illinois State normal schools, class of 1919, and to persons (otherwise qualified) who have not been teachers the past year but who are under contract to teach in the state during the coming year.

A person who wishes to take advantage of the scholarship privilege should present to the Registrar prior to June 1, 1919, a statement from the board of education employing him, to the effect that he has either been teaching during the past year or is under contract to teach during the coming year. A normal school graduate (class of 1919) must present either a diploma or a written statement from the president of the normal school certifying that he is a graduate of this year's class.

Application blanks for scholarships may be obtained by addressing the Registrar.

The Bachelor's Degree

All the undergraduate work offered in the Summer Session carries regular university credit which may be counted, unless otherwise specified, towards the degree of Bachelor of Arts or Bachelor of Science. By careful selection of courses the graduation requirements of the College of Liberal Arts and Sciences may be met in large part by Summer Session work. In the Colleges of Engineering and Agriculture the non-technical requirements and a part of the technical engineering or agricultural requirements may be covered in the Summer Session. For the detailed requirements of the several colleges the student should consult the Annual Register of the University under the head of the college in which he is interestd. *A student who is definitely a candidate for a degree* should also check over the work he has had and plan his future course in consultation with the dean or assistant dean of the college of his choice—

For the College of Liberal Arts and Sciences—Dean Babcock, Room 304, University Hall.

For the College of Commerce and Business Administration—Acting Dean Weston, Room 104, Commerce Building.

For the College of Engineering—Assistant Dean Jordan, Room 300, Engineering Building.

For the College of Agriculture—Assistant Professor Rankin, Room 100, Agricultural Building.

General Assembly

On the first Thursday of the Session, June 26th, at 4 p. m., an Assembly will be held in Room 218, University Hall. All students and members of the instructional staff are requested to attend. At this time general announcements will be made concerning lectures, entertainments, etc.

Lectures, Receptions, and Entertainments

In addition to the regular class exercises, the Summer Session provides a number of incidental exercises which give an atmosphere differing but little from that of the other sessions of the year: receptions given to the students; entertainments, debates, teachers' conferences, and clubs arranged by the students themselves; games and athletic contests; and the general lectures given by members of the University departments and by men from other institutions.

The song services, which proved so successful during recent Sessions, will be continued, under the direction of Director J. L. Erb of the School of Music. All students and faculty members are cordially invited to take part in the singing on the Auditorium steps each Wednesday evening, 6:45 (except in the first and last weeks).

Director Erb will give a series of six organ recitals during the Session.

Preparation for State Teachers' Certificates

To teachers who desire to make thorough preparation for the state-certificate examinations, the Summer Session offers marked advantages, especiall in connection with the professional subjects.

Among the provisions of the certificating law, enacted by the General Assembly in 1913, are the following examination requirements for the various kinds of certificates:

State Certificates

1. Four-year elementary- school certificate: Examination in English, educational psychology, and principles and methods of teaching.
2. Four-year high-school certificate: Examination in English, educational psychology, and principles and methods of teaching.
3. Four-year supervisory certificate: Requirements are the same as for the elementary-school certificate, except that the examination includes, in addition, sociology, history of education, and school organization, administration, and supervision.

County Certificates

1. Third-grade elementary-school certificate: Examination in common branches.
2. Second-grade elementary-school certificate: Examination in common branches, pedagogy, elementary science.
3. First-grade elementary-school certificate: Examination in the common branches, three of the natural sciences; English, algebra, general history and pedagogy.
4. High-school certificate: Examination in English, pedagogy, and six high-school subjects.
5. Supervisory certificate: Examination in English, educational psychology, history of education, and school administration.
6. Special certificate: Examination in English and principles and methods of teaching.

Examinations for the *State Elementary-School Certificate,* the *State Supervisory Certificate,* and the *State High-School Certificate* will be held at the University in July, *provided that at least fifteen applicants notify the State Superintendent prior to June* 10, 1919, *of their wish to take the examination here.*

The following excerpt from Circular No. 72 of the office of the State Superintendent of Public Instruction describes the new method of preparing theses:

"A thesis prepared under the direction of a teacher in a normal school, college or university, either in residence or by correspondence, and accompanied by a statement from such teacher as to the method and spirit of study, the originality and thoroughness shown by the candidate in such preparation and an estimate of the thesis, will be accepted. Candidates who cannot prepare a thesis under these conditions will be given three hours at the examination to write upon the subject selected."

The instructors at the University will be glad to direct the preparation of theses to be submitted to meet the above requirements.

The following Summer Session courses are especially adapted to prepare for the professional examinations:

Education S-la, S-lb, and S-10; Principles and Methods of Teaching.

Education S-4, S-20, and S-21 will be valuable for those preparing theses for the State Advisory Certificate.

Education S-2; History of Modern Education. (The applicant for the State Supervisory Certificate must pass an examination in the history of education.)

Education S-25; Educational Psychology. (This course, in connection with Education S-la, should prepare for the examination in educational psychology.)

Education S-6; The Principles of High-School Education.

Attention is also called to the various courses in English and rhetoric in connection with the English requirements for all certificates.

Graduate Work in the Summer Session

Recently the Summer Session has placed increasing emphasis on graduate courses leading to the master's degree. The various departments which are closely related to high-school teaching and to educational administration have been selected as the centers of this emphasis. An attempt is made to vary the graduate offerings from year to year so that advanced students who attend the University summer after summer may continue to find acceptable work in their chosen fields. During the coming summer especial emphasis will be laid on graduate courses in chemistry, economics, education, English, mathematics, Romance languages and physics.

The normal requirements for the master's degree is satisfactory work continued during one year of residence. This means a residence of thirty-six weeks at the University. Qualified graduate students may fulfill this residence requirement in four summer sessions of eight weeks each and an additional four weeks' study at the University under the direction of the person in charge of the major work. Thus the student by working at the University for one week after each Session under the direction of the professor in charge of his major subject may earn the master's degree in four summers.

In certain cases it will be possible for the graduate student to complete the last fourth of his residence requirement under a leave of absence. This privilege may be granted in the event that the student is able to take advantage of opportunities for research and investigation that are not afforded in the University community. Superintendents, principals, and class-room teachers frequently find it possible to carry on investigation in connection with their school work. There are, for example, numerous problems of school administration and of teaching for which the public school itself forms the only available "laboratory." Where the investigation of such problems is prosecuted under the direction of a university department, it may be possible, on individual petition, to count the work toward the master's degree.

Vocational and Industrial Education Courses.

Courses will be offered in vocational and industrial education in preparation for teaching agriculture, home economics, and the industries under the terms of the Smith-Hughes Act. For such courses in the training of teachers of agriculture, see page 16, in home economics, see page 31, in the industries, see pages 32 and 33.

"Through the enactment of the Smith-Hughes Act, State Boards for Vocational Education in each of the states accepting the provisions face the comparatively new problem of training teachers for service in the Vocational Schools or Departments of Trade and Industrial Education which have been established, or may be established in accordance with the standards of the Federal law." (Carris Memo. Federal Board for Vocational Education.) The University of Illinois, College of Education, has been appointed by the Illinois State Board of Vocational Education as an institution to give such training for the State of Illinois.

The following courses will be given in the Department of Industrial Education: Introduction to Industrial Education; Teaching Related Technical Subjects; Teaching Non-Vocational Subjects; Teaching Shop Work; Teaching Commercial Work; Carpentry, and Cabinet Making; and Organization, Administration, and Supervision of Manual Arts.

The courses in vocational and industrial education will be given by Assistant Professor McKinney, formerly of the Emergency Fleet Corporation, Professor Crawshaw, Professor of Industrial Education, Mr. Bernard W. Noel, Instructor in Machine Work and Mathematics, Central High School, St. Louis, Missouri, and Mr. Beryl R. Hall, Instructor in Pattern Shop Practice and Management.

The prerequisites for industrial courses in the Summer Session and the complete description of the courses are stated on pages 32 and 33.

Courses in Library Science.

Beginning Tuesday, June 24, 1919, and continuing for six weeks, the Library School will conduct courses to which will be admitted only high-school graduates actually employed as librarians, or library assistants, or as teacher-librarians, or under definite appointments to serve in such positions. The curriculum will meet especially the needs of workers n college, public, and high-school libraries of Illinois, and no tuition fee will be charged students entering from a library n this state; students entering from libraries in other states will pay a tuition of $12. The work is under the general direction of the faculty of the Library School, and the instruction will be given by members of the faculty, supplemented by lectures by neighboring librarians. No credit toward a degree is given for the work.

In addition to this, courses of the regular two-year curriculum are offered to college graduates who can satisfy the entrance requirement. These courses are accepted for credit to the B. L. S. degree. Admission to these courses is conditioned on the presentation of credentials showing that the applicant holds a Bachelor's degree in Arts or Sciences from the University of Illinois or has had other equivalent training.

Application blanks for admission must be secured, and these should be filled out and sent to the Director of the School together with such additional statements as the candidate may offer, showing his qualifications for admission. The application must be filed sufficiently early to enable the School to receive replies from librarians and others who have personal knowledge of the applicant.

For further information than that contained in the description of courses, (pages 34 and 35), address the Director of the University of Illinois Library School, Urbana, Illinois.

Teachers' Conferences

The informal features of the session will include a continuation of the Conference of Teachers, Superintendents, and Principals. The importance of these round-table discussions, supplementing the more formal class exercises, has been amply demonstrated by the experience in other sessions. Dr. W. W. Charters, Dean of the College of Education, Dr. B. R. Buckingham, Director of the Bureau of Educational Research, and Dr. J. A. Stevenson, Director of the Summer Session, will aid in organizing and conducting these conferences.

Teachers' conferences have also been arranged for by the Departments of Agricultural Education, Education, English, Industrial Education, Mathematics, Physics, and Romance Languages.

Teachers' Courses.

In addition to the teachers courses which are given in connection with the Smith-Hughes Act in the Departments of Agriculture, Home Economics and Industrial Education, the following special courses for teachers will be given:

S15. Accountancy.—Teachers' course in bookkeeping. Assistant Professor Scovill

S30. Botany—Methods of Teaching. Professor Trelease, Dr. Hague

S17. Chemistry—Teachers' Course. Assistant Professor Hopkins

S9. Entomology—Insect Materials for Teachers of Biology. Dr. Glasgow

S18. History—The Teaching of History. Professor Greene, Professor Alvord, Assistant Professor Cole, Dr. Jones

S4. Latin—First Year Latin (Methods Course). Professor Barton

S35. Mathematics—Teachers' Course. Dr. Lytle

S6. Music—Public School Music Methods. Miss Phillips

S18. Physics—Teachers' Course. Mr. Lapp

Romance Language.

S25. French—Methods of Teaching French. Professor Carnahan

S25. Spanish—Methods of Teaching Spanish. Professor Fitz-Gerald

Special Library Course for High School Teachers

S12. General References. This course comprises lectures on problems in the classification and arrangement of books in the library, the use of the card catalogue, and a study of groups of reference books such as cyclopedias, dictionaries, indexes, and handbooks of various sorts. It is of particular value to those planning to teach in high schools. Miss Boyd

Courses for Athletic Coaches

Courses for Athletic Coaches were established in connection with the Summer Session of 1914, under the general direction of George A. Huff, Director of Physical Education for men, to meet the growing demand, not only from high schools, but from colleges and other institutions as well, for trained men to direct and coach athletics. They were designed to assist both the high-school teacher or principal, who desired to become proficient in coaching one or more athletic teams and the man who intended to take up the directing of athletics or coaching as a vocation.

The courses will again be a feature of the Summer Session, occupying the first six weeks. All the courses will be taught by the men who coach the athletic teams of the University of Illinois: in baseball (Director Huff), track athletics (Mr. Harry Gill), basketball (Mr. Ralph Jones), gymnastics (Arthur J. Schuettner), and football (Mr. Robert Zuppke). The athletic plant of the University is turned into a laboratory and a larger part of the instruction is given on Illinois Field.

Students may devote either their whole time, or part of their time to these courses. Detailed information regarding the courses for Athletic Coaches may be found in a special circular which will be sent on application to George A. Huff, Director, Gymnasium, Urbana, Illinois.

Athletics

Although both the men's and women's gymnasiums will be used in some parts of the regular class work in Physical Education, they are nevertheless open to students not registered in those courses, for the purpose of general recreation and exercise. Both of the gymnasiums contain swimming pools, shower baths and other forms of bath, lockers, and dressing rooms. Students are charged a small sum for a locker. The tennis courts, general athletic fields, and golf course on the University campus are open to the student body.

Board and Lodging

The fact that the larger part of the usual University community will be away at the time of the Summer Session will make lodgings and boarding accommodations plentiful. The Young Men's and Young Women's Christian Associations of the University will prepare a list of boarding places which can be recommended, and they will aid students in securing desirable locations.

Board may be obtained at from $4.50 to $6.00 a week.

Double rooms in pleasant localities near the University may be had at from $8 to $10 a month.

Information

For further information on any matter connected with the Summer Session, address the Registrar or

JOHN ALFORD STEVENSON,
Director of the Summer Session,
203 University Hall,
Urbana, Illinois.

DESCRIPTION OF COURSES

Explanation

The arrangement of subjects in the followng description of courses is alphabetical. The connections of allied departments are indicated by cross references.

"S" (summer) which is prefixed to each of the courses offered is the sign used to distinguish the Summer Session courses from those having the same number offered during the regular University year. Following the description of each course will be found a statement of requirements for admission to that particular course and a statement of the equivalency of credit for such course as related to the course given in other sessions of the University. For example, the prerequisite for mathematics 9 is mathematics 7. This means that mathematics 7 must be completed before mathematics 9 may be taken. Since the Summer Session courses do not invariably cover the same ground as courses similarly numbered in the regular sessions of the University, the equivalency is sometimes noted as partial rather than full.

If a course not required for graduation is selected by fewer than five students, it may be withdrawn.

Graduate courses are numbered upwards from 100. Such courses are open only to graduate students.

Credit is reckoned for the undergraduate students in *semester hours* or simply *hours*. An *hour* represents one classroom period a week for one semester, or the equivalent in laboratory, shop, or drawing room. The number of hours for which each course counts is shown after each course by the figure in parenthesis, for example, Education S 1A. (2½).

The following abbreviations are used to designate the different buildings used during the Summer Session:

Adm.	Administration Building
Agr.	College of Agriculture
Chem.	Chemistry Laboratory
Com.	Commerce Building
E. H.	Engineering Hall
Farm Mech.	Farm Mechanics Building
Gen.	Genetics Building
App. Mech.	Laboratory of Applied Mechanics
Law	Law Building
L. H.	Lincoln Hall
Physics	Physics Laboratory
N. H.	Natural History Building
Stock Pav.	Stock Pavilion
Trans.	Transportation Building
U. H.	University Hall
Viv.	Vivarium Building
W. B.	Woman's Building

AGRICULTURE AND AGRICULTURAL EDUCATION

(See Agronomy, Animal Husbandry, and Horticulture)

Dean Davenport, Assistant Professor Nolan, Mr. Colvin, Mr. Reid, Mr. Greene.

(All courses given in the College of Agriculture are designed for teacher training in vocational agriculture, meeting the provisions of the Smith-Hughes Act for Vocational Education.)

S1. General Agriculture—This course is designed to meet the needs of those who are not specializing in agriculture. The major phases of farming will be considered. The larger problems of the farm and farmer will be studied in their relation to the school. Selection of subject matter and methods of presentation for elementary and secondary schools. Lectures, demonstrations and field trips. M.T.W.T.F., 9; 122 Agr. (2½). Mr. Colvin

S2. The Teaching of Agronomy.—A study of the content of a year's course in agronomy for high schools. Farm crops and soils and methods of organization for instruction on the project basis. M.T.W., 9; 553 Agr. (1½). Mr. Reid

S4. Projects in Vocational Agriculture.—A study of the subject matter involved and the methods used in plant and animal projects in vocational agriculture, recommended by the State Board for Vocational Education. M.T.W., 10; 122 Agr. (1½). Mr. Reid

Equivalent: Agricultural Education 4 (in part).

S6. The Teaching of Agriculture.—Principles and methods in teaching vocational agriculture. A study of the Smith-Hughes Act in its relation to agriculture. Designed for teachers of vocational agriculture in secondary schools. M.T.W.T.F., 8; 122 Agr. (2½). Mr. Colvin

Equivalent: Agricultural Education 3 (in part).

Prerequisite: One year or its equivalent in technical agriculture.

S7. Boys and Girls' Club Work.—A course designed for supervisors and leaders of boys and girls' club work, county leaders and urban garden supervisors. M.T.W.T. 3; 1210 Springfield avenue. (2). Mr. Greene

S90. Problems of Rural and Agricultural Education.—Designed primarily for superintendents and principals who are concerned with the problems and administration of rural and agricultural education. Rural life conditions and needs, and the agencies for improvement. The place and development of agricultural education in rural progress. M. T. W., 8; Agr. (2). Mr. Reid

Courses for Advanced Undergraduates and Graduates

S91. Supervision of Vocational Agriculture.—A course designed for those interested in the supervision and administration of agricultural education, either as state supervisors, instructors in teacher-training departments or directors of vocational agriculture in secondary schools. M., 4-6; Agr. L. (1). Assistant Professor Nolan

Prerequisite: Graduate or senior standing.

S99. Policies in Agricultural Education.—National, state, and local problems and policies in agricultural education. Vocational education in relation to the farmer's life and work. M. W., 11; 100 Agr. (1). Dean Eugene Davenport

Prerequisite: Graduate or senior standing.

AGRONOMY

Associate Professor Lehmann

S26. Elementary Farm Mechanics.—Ropes, soldering, babbitting, belt lacing, pipe cutting, plumbing, sewage disposal, farm water supply systems, lighting systems,

heating systems, power transmission, and equalizers. Methods of organizing and presenting this material for secondary schools and home project work. M.T.W.T.F., 1, 2; 205 F. M. (2½). Associate Professor LEHMANN

Equivalent: Agronomy 25 (in part).

S28. Farm Machinery.—The more important farm machines, such as plows, binders, mowers, etc. The horse and tractor as prime movers. Methods of adapting this material to the needs of secondary schools and home project work. M.T.W.T.F., 3, 4; 205 F. M. (2½). Associate Professor LEHMANN

Equivalent: Agronomy 26 (in part).

ANIMAL HUSBANDRY

Mr. GUSLER, Mr. ROBERTS, Mr. BARTO

S5a. Animal Husbandry for Schools.—The types and breeds, selection for market and for breeding purposes, breeding, feeding, care and management of live stock, with special reference to the materials and methods of teaching animal husbandry in schools. M.T.W.T.F., 8; Stock Pavilion (2½). Mr. GUSLER

Equivalent: Animal Husbandry 5 (in part).

S21a. Live Stock Management.—The fundamental principles of feeding and management of live stock. Lectures, recitations, assigned readings, observation and practice. Designed to aid teachers in the live stock project work of vocational agriculture. M.T.W.T., 9; Stock Pavilion (2). Mr. GUSLER

Equivalent: Animal Husbandry 21 (in part).

S23a. Poultry.—Principles and practices of poultry raising on the farm and at the village home. Identification and comparison of breeds; housing, feeding, fattening, marketing; handling eggs, hatching and raising chicks, caponizing, etc. Time to be arranged. (2½). Mr. BARTO

Equivalent: Animal Husbandry 23 (in part).

S30. Genetics.—Principles of breeding and genetics in their relation to plant and animal improvement. Methods of teaching, selection of pertinent illustrative material, subject matter, and types of observation and projects possible for secondary schools. M.T.W.T., 11; 107 Genetics (2). Mr. ROBERTS

Equivalent: Animal Husbandry 30 (in part).

ART AND DESIGN

Assistant Professor LAKE

S1. Elementary Art.—Practice drawing in pencil and charcoal; perspective study and the rendering of effects in landscape, figures, and still-life. A general study of graphical expression with practice to acquire skill in freehand drawing and understanding of the principles of proportion, perspective, light, shadows, shade and composition. M.W.F., 1, 2; 405 U. H. (2). Assistant Professor LAKE

Equivalent: Art and Design 1.

S9. Art for the Common Schools.—The planning and execution of work in the common-school art study; design; black-board drawing. Lectures on organization, equipment, and the administrative side of the supervisor's work. For supervisors of art, and public-school teachers. T.T., 1, 2, 3; 405 U.H. (2). Assistant Professor LAKE

S20. History of the Fine Arts.—Periods and styles of architecture, sculpture, and painting during the Italian Renaissance and to the present time. M.W.F., 3; 410 U.H. (2). Text: *Apollo by S. Reinach;* Charles Scribner's Sons, New York.
Assistant Professor LAKE

Equivalent: Art and Design 19.

BOTANY

Professor TRELEASE, Dr. HAGUE

Courses for Undergraduates

S1. General Botany.—Structure, physiology, natural history, and uses of plants. Intended as a foundation for advanced study in any branch of botany, as well as giving the general knowledge of plant life which every educated person should possess. Lecture T.W.T., 8; 228 N.H. Laboratory T.W.T., 9-12; N.H. (4).
Professor TRELEASE, Dr. HAGUE

Equivalent: 4 hours of Botany 1.

S2a. Morphology of Thallophytes.—Comparative laboratory study of selected types of the lower plants; intended to give personal acquaintance with the flowerless plants and the increasing complexity in structure and function which marks evolutionary development. Laboratory M.F., 8-12; 216 N.H. (4). Dr. HAGUE

Prerequisite: Botany 1 or its equivalent.

Equivalent: 4 hours of Botany 2a.

S4d. Trees and Shrubs.—A systematic study of woody plants, especially those most used in decorative planting. Intended also to give facility in naming such plants when not in flower. Laboratory T.T., 9-12; 308 N.H. (2). Professor TRELEASE

Prerequisites: Botany 1, or its equivalent.

Equivalent: 2 hours of Botany 4d.

S30. Methods of Teaching.—Participation in elementary laboratory instruction and in conference of department staff. Time to be arranged; 6 hours for laboratory, 1 hour for seminar. (2). Professor TRELEASE, Dr. HAGUE

Prerequisite: 15 hours of botony; senior standing.

Equivalent: Botany 30.

Courses for Advanced Undergraduates and Graduates

S16b. Taxonomy and Morphology of Algae and Bryophytes.—Advanced laboratory practice on selected groups. Time to be arranged. 306 N.H. (2-4). Dr. HAGUE

Prerequisite: 10 hours of botany including 2a or 4b; junior standing.

Equivalent: Botany 16b (in part).

S17. Taxonomy of Cormophytes.—Advanced laboratory practice on selected groups. Time to be arranged. 304 N.H. (2-4). Professor TRELEASE

Prerequiste: 10 hours of botony including 4a; junior standing.

Equivalent: Botany 17a-b (in part).

Courses for Graduates

S108. Taxonomy.—Monographic studies of critical groups. Time to be arranged. 304 N.H. (½-2 units).

BUSINESS ORGANIZATION AND OPERATION

(See also Economics and Transportation)

Assistant Professor SCOVILL, Mr. LITTLETON

ACCOUNTANCY

Courses for Undergraduates

S2a-2b. Advanced Accounting and Auditing.—Fundamentals of cost accounting, theory of partnership and corporation accounts, depreciation, goodwill, reserves, and

sinking funds; special financial statements, reading balance sheets, illustrative problems. Texts: Rowe's Cost Accounting; Klein's Elements of Accounting. M.T.W.T.F.S., 10, 11; 303 Com. (6). Mr. Littleton

Prerequisite: Accountancy 1a-1b; Economics 7 or 26, 22 or 27; credit in Economics 1.

Equivalent: Accountancy 2a-2b.

S15. Teacher's Course in Bookkeeping.—Methods of approach in teaching; conduct of laboratory work; explanation of difficult transactions; logical development and treatment of columnar books, notes and drafts; interest, discount, controlling accounts, specialized books and records, inventories and financial statements. Lectures on different systems in use. General philosophy of accounts. No specific text book assigned, but several will be used to illustrate methods. M.T.W.T.F.S., 9; 206 Com. (3). Assistant Profesor Scovill

Courses for Advanced Undergraduates and Graduates

S4a. Cost Accounting.—Cost accounting (a) applied to factory procedure, overhead expense, the installation and control of cost systems, presentation of cost data; (b) as a basis for manufacturing efficiency; (c) the construction of cost systems; government cost-plus accounting. Text: *Nicholson and Rohrbach's Cost Accounting.* T.W.T.F., 8; 206 Com. (2). Assistant Professor Scovill

Prerequisite: Accountancy 2a-2b.
Equivalent: Accountancy 4a.

CHEMISTRY

Assistant Professor Beal, (in charge), Assistant Professor Hopkins, Assistant Professor Lewis, Assistant Professor Adams, Assistant Professor Reedy, Dr. Englis, Dr. R. M. Parr, Dr. Braley, Dr. Rindfusz, Mr. Van Winkle, Mr. Barnes, Miss Sparks.

Note: All of the courses in chemistry in the Summer Session are equivalent to the courses of the same numbers given during the academic year.

Courses for Undergraduates

S1. Elementary Chemistry.—The non-metallic elements. Text: *Noyes' Text Book of Chemistry, Noyes and Hopkin's Laboratory Exercises*, published by Henry Holt & Co. Lecture—quiz, M.T.W.T.F.S., 11; Laboratory, M.T.W.T.F.S., 8, 9 or 9, 10; Chem. (5). Assistant Professor Hopkins, Dr. Englis, Dr. R. M. Parr

S1a. Inorganic Chemistry.—For students who have had one year of high-school chemistry. This course may be taken at the same hours as Chemistry S1, but only four hours of laboratory work are required. Chem. (3).
Assistant Professor Hopkins, Dr. Englis, Dr. R. M. Parr

S1b. Inorganic Chemistry.—For engineering students. This course may be taken at the same hours as Chemistry S1, but only six hours of laboratory work are required. Chem. (4). Assistant Professor Hopkins Dr. Englis

S2a. Inorganic Chemistry and Qualitative Analysis.—Chemistry and qualitative analysis of the more common metals and inorganic compounds. Texts: Noyes' *Text*

Book of Chemistry, Noyes and Smith's *Qualitative Analysis*, published by Henry Holt & Co. Lectures, M.T.W.T., 9; Quiz, M.T.W.T., 8. Laboratory, M.T.W.T.F.S., 10, 11; Chem. (5). Dr. Reedy, Dr. R. M. Parr

Prerequisite: Chemistry 1 or 1a.

S3a. Inorganic Chemistry and Qualitative Analysis.—For students in chemistry and chemical engineering. Texts: Noyes' *Text Book of Chemistry*, Noyes and Smith's *Qualitative Analysis*. Arrange; Chem. (6). Dr. Reedy, Dr. R. M. Parr

S5a. Elementary Quantitative Analysis.—Gravimetric and volumetric methods; stoichiometrical relations, the fundamental laws of chemistry and their applications to quantitative analysis. Text: Talbot's *Quantitative Chemical Analysis*. Lecture or quiz, M. T. W. T., 8; Laboratory, M. T. W. T., 9-12. F., 8-12. 260 Chem. (5). Dr. Beal, Dr. Braley, Mr. Van Winkle

Prerequisite: Chemistry 2a or 3a.

S5b. Quantitative Analysis.—(Continuation of Chemistry 5a). Analysis of silicates, metallic compounds, and alloys; advanced qualitative analysis. Lectures; recitations; laboratory. Treadwell-Hall; Analytical Chemistry, Vol. I, II. Lecture or quiz, M.T.W.T., 9-12; 260 Chemistry. (5).
Assistant Professor Beal, Dr. Braley

Prerequisite: Chemistry 5a.

S13a. Agricultural Analysis.—Gravimetric and volumetric analysis; analysis of fertilizers and milk. Parallel with Chemistry 5a. Talbot's *Quantitative Chemical Analysis*. (For students in agriculture and household science). Lecture or Quiz, M.T.W.T., 8; Laboratory, M.T.W.T., 9-12, F., 8-12; 260 Chem. (5).
Dr. Beal, Dr. Braley, Mr. Van Winkle

Prerequisite: Chemistry 2a or 3a.

Courses for Undergraduates and Graduates

By suitable selection of courses through four consecutive summers it will be possible for persons attending the Summer Session to meet the requirements for the Master's degree, with the exception of the completion of a course in physical chemistry. It is hoped that such a course may be given in subsequent years.

S14a. Elementary Organic Chemistry.—This course should be accompanied by laboratory work, S14c. M.T.W.T.F.S., 8; 217 Chem. (3). Assistant Professor Adams

Prerequisite: *Chemistry* S2a or S3a or equivalent course.

S14b. Organic Chemistry. (second course).—Continuation of Chemistry S14a, with emphasis on special chapters. Library assignments. Not given unless elected by more than three students. M.T.W.T.F.S. 8; 217 Chem. (3).
Assistant Professor Adams, Dr. Rindfusz

Prerequisite: Chemistry S14a and S14c or equivalent.

S14c. Organic Chemistry (elementary laboratory).—Typical laboratory methods; syntheses of some of the more important organic compounds. Four times a week, 9-12; 250 Chem. (2). Dr. Rindfusz

Prerequisite: Registration in Chemistry S14a or completion of a course equivalent to S14a.

S14d. Organic Chemistry (advanced laboratory).—Synthetical preparations in organic chemistry, and quantitative organic analysis. Four times a week, 9-12; 250 Chem.; (2). Assistant Professor Adams, Dr. Rindfusz

Prerequisite: Registration in Chemistry S14b or completion of a course equivalent to S14b.

S15. Physiological Chemistry.—Enzymes; carbohydrates; salivary digestion; gastric digestion; fats; pancreatic digestion; intestinal digestion, bile putrefaction products; feces; blood; milk; epithelial and connective tissues; muscular tissue; nervous tissue; urine. Qualitative and quantitative, work on gastric juice, blood, urine, and milk; the clinical aspect of these topics treated thoroughly for the prospective student of medicine. Lectures; demonstrations; conferences; practical work; assigned reading. Mathews' *Physiological Chemistry,* 6th Ed.; Hawk's *Practical Physiological Chemistry,* 5th Ed. M.T.W.T.F., 8-12; 463 Chem. (5).
Assistant Professor Lewis

Prerequisite: Chemistry 5a or 13a, and 14a-b or 9 and 9c, or equivalent.

S15a. Problems of Metabolism.—Variations of metabolism in health and disease; chemistry of the ductless glands; chemical methods of diagnosis; micro-analysis of blood, tissues, and urine. Lectures; conferences; laboratory. Hawk's *Practical Physiological Chemistry.* 6th Edition. (Not given unless elected by more than four students). T.W.T., 9-12; S.; 463 Chem. (3). Assistant Professor Lewis

Prerequisite: Chemistry 15 or equivalent.

S17. Teachers' Course.—Methods of teaching elementary chemistry. T.T., 10; Chem.; (1). Assistant Professor Hopkins

Prerequisite: 13 hours chemistry and senior or graduate standing.

S21. Qualitative Organic Analysis.—Systematic methods for the identification of pure organic compounds and mixtures. 250 Chem. (3). Four laboratory periods to be arranged in afternoons. Dr. Rindfusz

Prerequisite: Chemistry S14b and S14d or equivalent.

S25. (formerly S5c). Food Analysis.—Quantitative organic analysis; examination of food and drug products; alcohols, carbohydrates, fats, and oils, animal and vegetable foods, nitrogeneous bodies, preservatives and colors. Sherman's *Organic Analysis* and Sherman's *Food Products, "Bulletin 107, rev. U.S. Bureau of Chemistry."* Lecture M.T.W.T.F., 11; Laboratory, M.T.W.T.F., 8-11; Chem, (5).
Dr. Beal, Mr. Van Winkle

S26. Pharmaceutical Chemistry.—The analytical chemical of medicinal substances, with a discussion of the common types of pharmaceutical preparations. *United States Pharmacopocia, Ninth Decennial Revision.* Not given unless elected by more than four students. Lectures, M.W.F., 8; Lab., M.W.F., 9-12; 260 Chem. (3). Dr. Beal

Prerequisite: Chemistry 14a-14b.

S27. Qualitative Analysis of the Rarer Elements.—The rarer elements and their compounds; identification and separation of the elements; formation, solubilities, and chemical reactions of their salts. Lectures, laboratory. Lecture, W., 9; 303 Chem.; Laboratory, Arrange. (3). Assistant Professor Hopkins

S65. Technical Gas and Fuel Analysis.—Examination of gases, gas mixtures, flue gases and fuels; determination of calorific values; calculation of efficiencies. Lecture, laboratory. White, *Gas and Fuel Analysis.* S.W. Parr, *Chemical Examination of Water, Fuel, Flue Gas and Lubricants.* M.W.F., 8-12; 260 Chem. (2). Dr. Braley

S92. Chemical Literature and Reference Work.—Periods, leaders, journals; use of literature. Lectures, reports, reference work. Two periods a week; arrange (1).
Miss Sparks

S11 and S111. Research.—Advanced work for undergraduates (S11) and research work for graduates (S111), in inorganic, organic, analytical, or physiological chemistry. Arrange hours and credit before registration.

Inorganic Chemistry	Assistant Professor Hopkins
Analytical Chemistry	Assistant Professor Beal
Physiological Chemistry	Assistant Professor Lewis
Organic Chemistry	Assistant Professor Adams
	Dr. Rindfusz

CIVIL ENGINEERING

(See Drawing (General Engineering), Mechanical Engineering and Mechanics)

Professor Ellis

Courses for Graduates

S106. Reinforced Concrete Design.—Elastic theory. Full time. (2 units). Professor Ellis

THE CLASSICS

LATIN

Professor Barton, Professor Oldfather

Courses for Undergraduates

S1. High School Latin.—Representative readings from the second, third, and fourth years, with discussions of material as reflecting Roman public and private life, political and religious ideals. Attention will be given to the most effective ways of organizing and presenting the materials of Latin instruction in the second, third, and fourth years. Students will provide themselves in advance with texts of Caesar, Cicero, and Vergil. M. T. W. T. F., 3; 120 L. H. (2½). Professor Barton

S2. Ovid.—Readings in the Metamorphoses; the place of Ovid in Latin literature; practice in sight translation. M. W. F., 11; 120 L. H. (1½). Professor Oldfather

Prerequisite: Two or three years of high-school Latin.

S3. Terence.—The Phormio and the Adelphi will be read. Attention will be paid to the verse and syntax in illustration of their historical development, and especially to the literary values. M. W. F., 10; 120 L. H. (1½). Professor Oldfather

Prerequisite: Three or four years of high-school Latin.

S4. First Year Latin.—The essentials of the first year's work will be taken together with a discussion of the problems arising both for student and instructor. This will involve methods of study and presentation. The slides and photographs of the classical department and the collections of the classical museum will be at the disposal of the class. M. W. F., 2; 120 L. H. (1½). Professor Barton

Courses for Undergraduates and Graduates

S114. Caesar.—An introduction to the times and methods of research in Caesar; the historical complex in which his writings were published and the motives governing their production; the literary school to which Caesar belonged and the literary aim for which he strove. Illustrative readings from the Bellum Civile. Twice a week; arrange. Professor Oldfather

Prerequisites Three years of college Latin.

DRAWING, GENERAL ENGINEERING

(See also Civil Engineering, Mechanical Engineering, and Mechanics).

Mr. Farnham

S1. Elements of Drafting.—Engineering lettering; orthographic projection; isometric oblique and perspective drawing; machine sketching; working drawings. Lettering; engineering styles and the making of name plates and titles. Mechanical drawing; drawings from specifications and models, with tracing. Dimensioned sketches from parts of standard machines; complete working drawings. Blue-print

and Van Dykes from tracings. Time sketches of equipment. Text: *Miller's Mechanical Drafting.* M. T. W. T. F. S., 8-11; 303 Trans. Bldg. (4). Mr. Farnham

Prerequisite: Graduation from an accredited high school or equivalent.

S2. Descriptive Geometry.—Theory of orthographic projection; the point, line, and plane; the properties of surfaces; tangents; intersections, and developments. Practical problems; recitations and drawing room work. Text: *Miller's Descriptive Geometry.* M. T. W. T. F. S., 8-11; 303 Trans. Bldg.

Prerequisite: Plane Geometry, solid geometry, high school algebra.

ECONOMICS

(See also Business Organization and Operation, and Transportation).

Associate Professor Thomson, Assistant Professor Weston, Dr. Hunter

Courses for Undergraduates

S2. Principles of Economics.—Text: Ely's *Outlines of Economics.* M. T. W. T. F. S., 10; 101 Com. (3). Associate Professor Thompson

Prerequisite: One year of university work or (for teachers) the permission of the instructor.

Equivalent: Economics 2.

S3. Money and Banking.—Principles of money; monetary system of the United States; money and prices; development and principles of credit and banking; principles of domestic and foreign exchange; banking system of the United States compared with other banking systems. Text: Holdsworth's *Money and Banking.* M. T. W. T. F., 9; 111 Com. (2½). Dr. Hunter

Prerequisite: Five hour course in the Principles of Economics or the permission of the instructor.

Equivalent: Economics 3 when used as a prerequisite.

Courses for Advanced Undergraduates and Graduates

S5. Public Finance.—The development and nature of public expenditures; the development of public revenues, especially taxes; justice in taxation; the present system of federal, state and local taxes; war finance. Text: Plehn's *Introduction to Public Finance.* M. T. W. T. F., 10; 111 Com. (2½). Dr. Hunter

Prerequisite: Five hour courses in the Principles of Economics, junior standing, or the permission of the instructor.

S9. Advanced Banking.—Recent banking development in the United States; present problems and practice. Students should provide themselves with a copy of Agger's *Organized Banking.* M. T. W. T., 9; 101 Com. (2). Assistant Professor Weston

Prerequisite: Economics 1 and 3, junior standing.

Equivalent: Economics 9.

S61. Economic Theory.—M. T. W. T., 11; 101 Com. (2). Associate Professor Thompson

Prerequisite: Economics 1 or 2 and any other course in economics for which Economics 1 or 2 is a prerequisite, junior standing, the permission of the instructor.

Equivalent: Economics 61.

TRANSPORTATION

(See also Business Organization and Operation, and Economics).

Assistant Professor Weston

Courses for Undergraduates

S1. Transportation System of the United States.—The development and economic problems of railway and other transportation in the United States. Text: Johnson and VanMetre's *Principles of Railroad Transportation.* M. T. W. T. F. S., 8; 101 Com. (3). Assistant Professor Weston

Prerequisite: Economics 1, junior standing.

Equivalent: Transportation 1.

EDUCATION

Dean Charters, Professor Butterworth, Professor Buckingham, Professor Hill, Director Stevenson, Mr. O'Gorman, Mr. Capps, Mr. Williams,

Mr. Powers, Miss Keen

Courses for Undergraduates

S1a. Principles of Education.—A study of the fundamental educational theories as they are derived from physiology, biology, sociology, and psychology. Special emphasis will be placed upon the principles underlying the learning process, interest, memory, habit and other factors of work in determining a theory of educational procedure as suggested by the needs of a democratic society. Text: *Education* by E. L. Thorndike. M. T. W. T. F., 9; Room 208 U. H. (2½). Mr. O'Gorman

Prerequisite: Junior Standing.

Equivalent: With Education S 1b, this course is equivalent to Education 1 as offered during the university year. Education 1 is required of all students who secure the official recommendation of the Appointments Committee for teaching positions in secondary schools.

S1b. The Educational System.—A survey of the school system of the United States; its organization together with such topics as distribution of pupil and teaching population, money cost of education and sources of income; its origin; its distinctive characteristics as compared with other systems; present day educational problems. M. W. F., 2; 208 U. H. (1½). Mr. Williams

Prerequisite: Junior Standing.

Equivalent: With Education S 1a, this course is equivalent to Education 1.

S2. History of Modern Education.—The first part of this course will be devoted to a brief survey of some of the more important of the Greek, Roman and medieval educators. This survey will be merely introductory to the more intensive study of the educational movements from the Renaissance to the present time. Special emphasis will be given to the development of national educational policies. Text: *A Student's History of Education,* by F. P. Graves. M. T. W. T. F., 1; 113 L. H.. (2½). Mr. O'Gorman

Prerequisite: Junior Standing.

S10. Technic of Teaching.—Discipline and classroom management; characteristics of pupils, individual differences; motive; types of learning—motor control, reflective thinking, and appreciation; types of instruction—drill, problem solving and the project; lesson for appreciation; supervised study; psychology of certain school subjects; function and structure of subject-matter measuring the results of the teaching process. M. T. W. T. F., 202 L. H., Sec. I, 8., Sec. II, 9. (2½). Mr. Capps

Prerequisite: Education 1.

Equivalent: Education 10.

S25. Educational Psychology.—The aims of this introductory course are threefold: (1) To set forth facts and principles of psychology bearing upon important educational questions; (2) to afford acquaintance with selected studies in educational psychology; (3) to give illustrations of experimental methods of attack upon problems of learning by means of class and individual experimentation. Readings, discussions, experiments. M. T. W. T., 9; 417 U. H. (2). Professor Hill

Prerequisite: Junior Standing.

Equivalent: Education 25 (in part).

Courses for Advanced Undergraduates and Graduates

S4. School Organization and Administration.—A course for school superintendents and principals. The establishment of schools and provisions for their administration; units of control; the development of school administration and school support; the superintendent's work; training, selection, and rating of teachers; methods of supervision; organization of curricula; uses of scales and standards in determining efficiency. Lectures, readings, and reports. M. T. W. T., 11; 202 L. H. (2).
Professor Butterworth

Prerequisite: Education 1 or equivalent.

Equivalent: Education 4 (in part).

S6. The Principles of High-School Education.—The evolution of high schools and of secondary education; high schools and the state system; legal status; articulation with the elementary school, college, technical schools, community, and home teaching staff; reorganization of curriculums; "controls" of construction; student activities; vocational and moral guidance; school journalism; debating activities; athletics; high-school hygiene. W. T. F., and one additional period to be arranged; 10; 202 L. H. (2).
Professor Butterworth

Prerequisite: Education 1 or equivalent.

Equivalent: Education 6 (in part).

S16. Educational Finance.—Methods of raising and apportioning state funds. School taxes and taxation units. Comparative study of the laws of various states. Remedial legislation as suggested by recent statutes. The school budget. Classification of accounts to meet federal and state requirements and local needs. Application of standards of expenditure for different types of schools and for different functions. Unit costs in elementary and secondary schools. T. T., 9; 419 U. H. (1).
Professor Buckingham

Prerequisite: Education 1 or its equivalent.

S17. The Teacher.—Preparation, selection, placement agencies, requirements for certification, salary, pensions, methods of promotion in service, professional ethics. Lectures, reading and discussions. T. T., 2; 208 U. H. (1) Mr. Williams

S19. Elementary School Curriculums.—Bases for curriculum organization and content; time allotment to subjects; historical development; fitting curriculum to the community; comparative study of leading curriculums of cities, counties, and states. Superintendents may use their own curriculums as subjects for individual study. T. W. T., 11, and one additional hour to be arranged; 202 L. H. (2). Dean Charters

Prerequisite: Senior Standing and Education 1 and 10.

Equivalent: Education 19 (in part).

S20. Supervision.—A course for superintendents, principals, and supervisors. Limitiations, types, functions, standards, and devices of supervisors; rating of teachers; M. T. W., 9; and one additional period to be arranged; 207 U. H. (2).
Professor Butterworth

S21. Educational Tests and Measurements.—Survey and evaluation of the most important published test material with the standards that have been derived. Elementary statistical theory. Practice in giving tests and in analyzing results. Graphic presentation. M. T. W. T., 8; 419 U. H. (2). Professor Buckingham

Prerequisite: Education 1 or a satisfactory equivalent.

S27. High School Curriculums.—Bases for curriculum organization and content; historical development; fitting the curriculum to community; reconstruction of high school curriculums, eliminations, additions, vocational, non-vocational, college preparatory curriculums; Smith-Hughes curriculums; particular attention to curriculums in English, physical education and the general sciences, social, biological and physical. Students who are high school teachers and principals may use their own curriculums as subjects for individual study. T. W. T., 2, and one additional hour to be arranged; 202 L. H. (2). Dean CHARTERS, Director STEVENSON

Prerequisite: Senior Standing and Education 1 and 10.

Equivalent: Education 27, (in part).

S28. The Project Method of Teaching.—A course for superintendents, principals, supervisors and teachers. A study of the current literature. The relation of the project to curriculum organization, thinking, motivation. Application of the project method. Lectures, readings, and investigation of special problems. T. T., 10; 202 L. H. (1). Director STEVENSON

Prerequisite: Education 1 and 10.

S43. Mental Tests.— The course deals with the development and use of tests of general intelligence, and of trade tests, as distinct from tests of achievement in school subjects and the classical experiments of the psychological laboratory. Emphasis will be put on actual practice work with group and individual tests, reports thereon, and readings. M. T. T. F., 10-12; 417 U. H. (2) Professor HILL

Prerequisite: Education 25, or Psychology 1, and consent of instructor.

COURSES FOR GRADUATES

S118. Seminar in Educational Research.—Individual investigation and reports on one or more of the following topics: scale derivation, child accounting, educational guidance, improvement of instruction through standardized tests. Statistical theory. M. W., 9; 103 L. H. (1½ unit). Professor BUCKINGHAM

S119. Curriculum Construction.—Principles of curriculum construction; technique of curriculum construction, critical examination of recent curriculum studies reported by the Committee on Economy of Time and others; analysis of curriculums proposed in Educational Classics; individual reports by members of class. T. W. T., 3; 103 L. H. (1 unit). Dean CHARTERS

S125. Seminar in Auxiliary or Special Education.—Subject: Psychology and education of exceptional persons—the gifted, the crippled, the feeble-minded, the blind, the deaf, the delinquent. W., 4-6; 407 U. H. (½ unit). Professor HILL

ENGLISH

A. LANGUAGE AND LITERATURE

Professor DODGE, Assistant Professor BALDWIN, Assistant Profesor JONES, Visiting Professor WOODBRIDGE, Dr. WHITFORD, Mr. KARR, Miss COPLEY

Courses for Undergraduates

S2a. Historical Survey of English Literature.—First part of the nineteenth century. Wordsworth, Coleridge, Lamb, Scott, Jane Austen, Byron, Shelley, Keats, Macaulay, Carlyle. etc. Text: *Century Readings in English Literature* (Part II). M. T. T. F., 9; 307 U. H. (2). Professor DODGE

Prerequisite: One year of College work or the equivalent.

Equivalent: First half of English 2. (Together with S2b this course covers the work of English 2. To be credited as equivalent to English 2, S2a and S2b must be taken simultaneously).

Sb2. Historical Survey of English Literature.—Second Part of the nineteenth century. Tennyson, Browning, Arnold, Swinburne, Morris, Dickens, Thackeray, Eliot, Hardy, Stevenson, etc. Text: *Century Readings in English Literature* (Part II). M. T. T. F., 11; 307 U. H. (2) Dr. WHITFORD

Prerequisite: One year of college work or the equivalent.

Equivalent: Second half of English 2 (See note under S2a).

S21. Literary Study of the Bible.—Hebrew literature as an expression of the life of the race that produced it; the debt, both ethical and artistic, of modern life to ancient Hebrew thought, with special emphasis on our obligations to the Hebrew prophets for our ideals of world peace and social righteousness. M. T. W. T., 9; 218 L. H. (2). Assistant Professor BALDWIN

Prerequisite: Eleven hours of English literature, or eight hours of English literature and eight hours of foreign language.

Equivalent: English 21 (in part).

S23. Introduction to Shakespeare.—Two gentlemen of Verona, A Midsummer Night's Dream, Richard III, Romeo and Juliet, Much Ado About Nothing, Twelfth Night, Othello, Lear, Tempest. Text: *Tudor Shakespeare*. M. T. W. T. F., 2; 315 U. H. (2½). Visiting Professor WOODBRIDGE

Prerequisite: One year of college English or junior standing.

Equivalent: English 23 (in part).

Courses for Advanced Undergraduates and Graduates

S3. The Poetry of Milton.—All Milton's poetry will be read both as an expression of the life of the age and as an expression of Milton's individual genius. M. T. W. T. F. S., 11; 218 L. H. (3). Assistant Professor BALDWIN

Prerequisite: Sixteen hours of English literature or two years of college work and the consent of the instructor.

Equivalent: English 3.

S8. Old English. (Anglo-Saxon).—Grammar, with specimens of prose and the shorter poems. Text: Bright's *Anglo-Saxon Reader*. M. T. W. T. F. S., 10; 110 L. H. (3). Professor DODGE

Prerequisite: Sixteen hours of English literature or two years of college work.

Equivalent: English 8.

S25. Chaucer.—Chaucer's poetry is studied with particular attention to mediaeval ideals and to English society in the fourteenth century. Text: Skeat's *Students' Chaucer*. M. T. W. T. F. S., 2; 218 L. H. (3) Assistant Professor JONES

Prerequisite: Two years of college work and the consent of the instructor.

Equivalent: English 25.

Courses for Graduates

S101. Research in Special Periods.—Individual conferences arranged with graduate students engaged upon definite pieces of investigation. (1 unit).

Professor DODGE, Assistant Professor BALDWIN, Assistant Professor JONES, Visiting Professor WOODBRIDGE

S128. Spenser and the Beginnings of the English Renaissance.—The persistence of certain mediaeval traditions reinforced by the Revival of Classical Learning. Catholicism and Calvinism as sources of literary inspiration. M. T. W. T., 3; 218 L. H. (1 unit). Assistant Professor JONES

B. RHETORIC

Visiting Professor Woodbridge, Dr. Whitford, Miss Copley

Courses for Undergraduates

S1. Rhetoric and Themes.—Principles of structure; grammar; punctuation; the sentence; reasoning processes. Four short themes a week and an occasional long theme. Oral and written exercises. Texts: *Handbook of Composition* and Scott and Denney's *Paragraph Writing*. M. T. W. T. F. S., two sections: A at 8, B at 9; 309 U. H. (3) Dr. Whitford, Miss Copley

Prerequisite: Entrance Credit in English.

Equivalent: Rhetoric 1.

S2. Rhetoric and Themes.—Principles of argumentation, narration, and description. Text: Scott and Zeitlin, *College Readings*. M. T. W. T. F. S., 10; 308 U. H. (3). Miss Copley

Prerequisite: Rhetoric 1.

Equivalent: Rhetoric 2.

Courses for Advanced Undergraduates and Graduates

S17. Advanced Composition.—Structure; criticism of current periodical literature; development of material for magazines. (Open to a limited number of students, and only on approval). M. T. W. T. F. S., 3; 218 L. H. (3). Visiting Professor Woodbridge

Prerequisite: Two years of college work.

Equivalent: Rhetoric 17.

C. PUBLIC SPEAKING

Mr. Karr

S1. Oral Expression.—Vocal Methods, relation of the voice to the interpretation of thought. M. T. T. F., 8; 318 U. H. (2). Mr. Karr

Prerequisite: Rhetoric 1 and 2 or equivalent.

Equivalent: Public Speaking 1.

(Credit is not given for this course unless it is followed by Public Speaking 2, 10, or their equivalents).

S10. Interpretation and Dramatization.—Oral reading of types of literature; principles of stage action; staging and acting of several one-act plays. (Attention of those who register in this course is called to English S23). M. T. T. F., 9; 318 U. H. (2) Mr. Karr

Prerequisite: Public Speaking 1 or equivalent.

Equivalent: Public Speaking 10.

S11. Problems in the Teaching of Oral English.—Primarily for high school teachers. M. W., 10; 318 U. H. (1) Mr. Karr

Prerequisite: The consent of the instructor.

ENTOMOLOGY

Assistant Professor Folsom, Dr. Glasgow

Courses for Undergraduates

S1. General Entomology.—Introduction to the study of insects in field and laboratory. Collection methods and methods for the preservation and preparation of insects for study. The structure, interrelations, origin, development, and classification

of insects. Recognition of the commoner species and their work, including forms injurious to field and garden crops and to the health of man and animals. Species of economic importance will be used for illustrative material wherever pertinent. Lectures; demonstrations; laboratory; field trips; assigned reading. Text: Entomology, with reference to its Biological and Economic Aspects, Folsom. M. W. F., 1, 2, 3, and T. T., 3; 408 N. H. (2) Dr. Glasgow

S3. Economic Entomology.—Life history and habits of the commoner injurious insects. Methods of control. Lectures; demonstrations; assigned reading. Text: Sanderson's *Insect Pests of Farm, Garden, and Orchard.* M. W. F., 4; 408 N. H. (1). Dr. Glasgow

Prerequisite: May be taken only by students registered at the same time in course S1.

Equivalent: (Together with S1) Entomology 4.

S5. Insects of the Vegetable Garden.—Practical studies of habits, development, and control of insects affecting vegetables. Text: Chittenden's *Insects Injurious to Vegetables.* T. W. T. F., 3, 4; 104 Vivarium. (2). Assistant Professor Folsom

S9. Insect Materials for Teachers of Biology.—Educational value of the experimental method in the teaching of biology. More frequent and more extended use of the experimental method made possible by the employment of insect materials. Types of classroom exercises. Sources of materials. Preparation of special collections, materials, demonstrations, and experiments, for illustrating the simpler generalizations of biological theory. Lectures; laboratory; field excursions; assigned reading. T. T., 1. 2; 405 N. H. (1) Dr. Glasgow

Prerequisite: One year's experience in teaching biology, or junior standing in the University. May be taken only by students registered at the same time in course S1.

Courses for Advanced Undergraduates and Graduates

S2. Advanced Course.—Instruction to meet the purposes of the individual student. Arrange; 405 N. H. Assistant Professor Folsom

Courses for Graduates

S108. Research in Economic Entomology.—Twice a week; arrange. (1or 2). Assistant Professor Folsom

FRENCH

(See Romance Languages)

GERMAN

Professor Lessing, Dr. Koller

Courses for Undergraduates

S4. Prose Reading.—Narrative prose, sight reading; composition. M. T. W. T. F. S., 8; 310 U. H. (3). Dr. Koller

Prerequisite: German 3.

Equivalent: German 4 (in part).

S6. Scientific Prose.—The rapid reading of works of a general scientific character. M. T. W. T., 8; 215 L. H. (2). Professor Lessing

Prerequisite: German 4 or three years of high school German.

Equivalents German 6 (in part).

S16. Composition and Conversation.—M. T. W. T., 9; 310 U. H. (2). Dr. KOLLER

Prerequisite: Two years of University German or an equivalent.

Equivalent: German 16.

S24. Modern Drama.—Reading and discussion of dramas by Hauptmann and others. M. T. W. T., 9; 215 L. H. (2). Professor LESSING

Prerequisite: Two years of University German or an equivalent.

Equivalent: German 24 (in part).

Courses for Advanced Undergraduates and Graduates

S26. History of German Literature.—The democratic movement between 1830 and 1860. Lectures; reports; discussions. T. T., 10; 215 L. H. (1). Professor LESSING

Prerequisite: Three years of University German or an equivalent.

Equivalent: German 26b (in part).

HISTORY

Professor GREENE, Professor ALVORD, Assistant Professor COLE, Dr. JONES

Courses for Undergraduates

S1c. European History, 1815-1919.—Special attention will be given to the historical background of the Great War. M. T. W. T. F. S., 8; 311 L. H. (3). Dr. JONES

Equivalent: Final one third History 1a-1b.

S3c. American History 1860-1919.—The recent history of the United States with Special attention to the Civil War and reconstruction and to international relations since 1898. M. T. W. T. F. S., 9; 305 L. H. (3).

Professor GREENE, Assistant Professor COLE

Prerequisite: One year of college work or its equivalent.

Equivalent: Final one third of History 3a-3b.

S18. The Teaching of History.—Conferences on problems of content and method. (1). (For students who prepare a satisfactory paper upon an assigned problem 2 credit hours). F., 3; (with conferences to be arranged).

Professor GREENE, Professor ALVORD, Assistant Professor COLE, Dr. JONES

Prerequisite: At least junior standing, including introductory courses in European and American history.

Courses for Advanced Undergraduates and Graduates

S9. The Italian Renaissance.—A study of the political, economic, and social changes developing in Italy between the eleventh and sixteenth centuries, which made for Italian leadership in European civilization. T. W. T. F., 10; (2). 311 L. H.

Dr. JONES

Prerequisite: One college course in European history or its equivalent.

S41. Biographical Studies in American History.—First four weeks: Typical personalities of the American Revolutionary era (Pitt, Franklin, Washington, Jefferson, with special attention to their part in western expansion); Second four weeks: Types of American nationality and American democracy in the 19th century (Clay, Jackson, Webster, Lincoln). M. T. T. F., 11; 305 L. H. (2). Professor ALVORD (first four weeks), Professor GREENE (second four weeks).

Prerequisite: One college course in American history or its equivalent.

S42. Studies in Middle Western History, 1848-1870.—T. W. T. F., 8; 305 L. H. (2). Assistant Professor COLE

Prerequisite: One college course in American history or its equivalent.

Courses for Graduates

S101. Seminar in American History.—Topics in Western History (Professor Alvord); Topics in Recent International Relations (Professor Greene). (½ unit). Arrange hours. Professor Greene, Professor Alvord

S103. Historiography and Historical Method.—The technique of historical investigation. (½ unit). Arrange hours. Assistant Professor Cole

S104. Research in European History.—Personal conferences with graduate students who desire guidance in research. (½ unit). Dr. Jones

HORTICULTURE

Professor Pickett

S1a. Elements of Fruit Growing.—Fruit growing with special reference to the home fruit garden. Recitations, lectures, and practical exercises. M. T. W. T., 11; S., 10, 11; 308 Agr. (2). Professor Pickett

Equivalent: Horticulture 1a (in part).

S2. Small Fruits and Grapes.—The strawberry, raspberry, blackberry, dew-berry, currant, gooseberry, and grape. History; extent of cultivation; soil; location; fertilizers; propagation; planting; tillage; pruning; insect enemies; diseases; varieties; harvesting; marketing. Lectures, recitations, and laboratory exercises. M. T. W. T., 2; F., 2, 3; 308 Agr. (3). Professor Pickett

Equivalent: Horticulture 2 (in part).

HOME ECONOMICS

Professor Bevier, Professor Handschin, Miss Bunch, Miss Hope, Miss Bane,

Miss Newburn, Miss Bond, Miss Guenther, Miss McCullough

The Department of Home Economics has an unusually large number of offerings this summer owing to the fact that it is giving not only its usual Summer Session work but a six weeks' course for the training of extension workers in Home Economics (See page 32). The very fact of the presence of these groups affords an unusual opportunity for seeing the present relationships and cooperation of these groups and thereby gives a better appreciation of the whole field.

S1. Foods.—Elementary work in selection and preparation of food, its combinations in a meal, with emphasis upon food values and the lessons taught by the war. Text: Bevier and VanMeter's *Selection and Preparation of Food* (Whitcomb and Barrows): Sherman's *Food Products* (Macmillan). Laboratory M. W. F., 10, 11; Lecture, Tu., 10; Quiz, Th., 10; W. B. (2). Laboratory fee $2.00. Miss Guenther

S9. Advanced Dietics.—Adapted to students who expect to teach in Smith-Hughes schools. Methods of presentation as modified by local conditions will be considered in the discussions. Laboratory work will be adapted to varying conditions. Text: Sherman's *Chemistry of Food and Nutrition* (Macmillan); Rose's *Feeding the Family* (Macmillan). Laboratory, T., Th., 8, 9; Lecture, M., 8; Discussion, W. F., 8; W. B.; (2). Laboratory fee $2.00. Miss Guenther

Prerequisite: A course in elementary dietetics; a year of general chemistry; a course in general physiology.

S4. Clothing.—Textiles used in clothing; cost and care of clothing; use of patterns; remodeling; the making of clothing. Text: Baldt's *Clothing for Women* (Lippencott). Lecture and discussion, M., 2; demonstration-lecture and laboratory, W. F., 1, 2, 3; W. B. (2). Miss McCullough

Equivalent: Two-thirds of Home Economics 12.

S5. Millinery.—Design and construction of wire, buckram, and cape net frames; covering with velvet and straw. Demonstrations and laboratory. T. T., 1, 2, 3; W. B. (1½). Miss McCULLOUGH

S6a. Costume Design.—The use and misuse of fashion and possible remedies for its evils. Value of budgeting. Essentials of suitable dress. Structural design in dress—proportion, silhouette, line, workmanship, and materials. The purpose of decorative design. The fundamental principles which govern both structural and decorative design. Problems in planning the wardrobe including remodeled and double-purpose dresses. Theory of color and systems of color organizations. Selection of colors suited to peculiar types. Lecture and discussion. S. 10, 11; laboratory T. T., 10, 11; W. B. (1½). Miss HOPE

Equivalent: One-half of Home Economics 19.

S6b. House Furnishing.—A study of constructive and decorative design in furniture and furnishings. The principles of rhythm, harmony, and balance as the basis for unity in house furnishing. Comparison of floor and wall coverings for durability, cost, and artistic merit. The selection and framing of pictures. The choice and arrangement of lighting fixtures both physiologic and artistic. A survey of English and French furniture and the three great art epochs which shaped it. Problems in floor plans and elevations involving the principles of design and color. Estimations of comparative cost of various types of furnishing. Assigned reading. Lecture and discussion, M. 10, 11; Laboratory, W. F., 10, 11; W. B. (1½). Miss HOPE

Special Course for Home Economics Extension Workers

Owing to the urgent call for extension workers in Home Economics, the University of Illinois offers a six weeks' course of instruction for candidates for such service. Topics to be considered are, the fundamental facts regarding rural life, the needs of the rural community, survey of the economic resources of the rural community, relation of rural wealth and income of improvement programs, relation of extension agencies to rural problems, methods of extension work.

A supplementary course in either public speaking, rural sociology, or journalism, may be taken in connection.

S10. Extension Course.—The application of the principles of psychology, sociology, and pedagogy in their relation to the problems of rural life and extension work; the technique of the demonstration-lecture and of the home demonstrations; the home bureau as a unifying factor in correlating the efforts of all organizations for home betterment; the relation of the county adviser to the home bureau, to the university, and to the federal department. Lectures and discussions. M. T. W. T. F. S., 8, 9, 2; W. B.; no credit. (Six weeks beginning June 24).

Professor BEVIER, Professor HANDSCHIN, Miss BUNCH, Miss BANE, Miss NEWBURN, and two representatives from the States Relation Service of the United States Department of Agriculture.

Prerequisite: Graduation from a four years' college course in Home Economics.

INDUSTRIAL EDUCATION

Professor CRAWSHAW, Assistant Professor McKINNEY, Mr. NOEL, Mr. HALL

S2. Woodwork.—Mastery of woodworking handtools, technical terminology, conventional methods of procedure. M. T. W. T. F. S., 9; Woodshop. (3). Mr. HALL

S3. Furniture Construction.—Construction and finishing of furniture. Use of woodworking machinery; woodturning. M. T. W. T. F. S., 9; Woodshop. (3). Mr. HALL

Prerequisite: Industrial Education 2.

S50. Introduction to Industrial Education.—A brief survey of the development

of manual arts and industrial education in the United States as a means of determining better the functions of each. A study of the Smith-Hughes Enactment as it has to do with industrial education. Illinois state plans and provisions. Method of attack in analyzing and classifying industrial content for instructional purposes; practice. M. T. W. T. F. S., 10; 214 U. H. (3). Assistant Professor McKinney

Prerequisite: Contact with trade or industry (a) through manual training shop courses or such courses as M. E. 75, 77, 79, 81, 82; or, (b) through practical commercial courses such as accounting, salesmanship, etc.; or, (c) through such Household Science courses as have a direct bearing upon the work of women or men in industry; or, (d) through practical experience in industry itself of not less than six months, eight hours a day, five and one-half days per week, or the equivalent.

S52. Teaching Related Technical Subjects.—Discussion of aims and methods best adapted to teaching such subjects as mathematics, science, drawing, when applied, in industrial schools and classes. Practice in analyzing and classifying the content of such subjects for instuctional purposes, and in relating the same to industrial content similarly analyzed and classified. Lesson planning. M. T. W. T. F. S., 1; 214 U. H. (3). Mr. Noel

Prerequisite: (a) A minimum of five hours in each and ten hours in some one of the following: College mathematics, physics, chemistry, freehand and mechanical drawing; (b) Education 25, 10; Industrial Education 50.

Note—During the session of 1919 the prerequisite of Education 25 and 10 will be waived and Industrial Education 50 may be taken concurrently with 52.

S54. Teaching Non-Vocational Subjects.—Discussion of aims and methods best adapted to teaching such subjects as industrial history, geography, economics; English; sanitation, safety, and hygiene; citizenship; as well as practical commercial subjects in general continuation part-time schools and classes. Practice in analyzing and classifying content of such subjects for instructional purposes. Lesson planning. M. T. W. T. F. S., 3; 214 U. H. (3). Mr. Noel

Prerequisite: A minimum of three hours in each and five hours in some one of the following groups: (1) Economics 7, 22, 26, 27, 1 or 2; Geology 35; (2) Rhetoric 1, 2, 3a or 3b, 10; Public Speaking, 1, 2; (3) Physiology 2, 3; Physical Training, Hygiene; (4) Political Science 1, 3, 4, 11; Sociology 1, (b) Education 25, 10; Industrial Education 50.

Note—During the session of 1919 the prerequisite of Education 25 and 10 will be waived and Industrial Education 50 may be taken concurrently with 54.

S56. Teaching Shopwork.—Discussion of aims and methods best adapted to teaching shopwork in industrial schools and classes and on the job. Practice in analyzing and classifying trade and industrial content content for effective instruction. Lesson planning; management. M. T. W. T. F. S., 2; 214 U. H. (3).
Assistant Professor McKinney

Prerequisite: (a) Two years of trade or industrial experience beyond the apprenticeship; (b) completion of an elementary school curriculum.

Note—Shop training in approved technical schools may be counted to the extent of one-half the practical experience required.

S57. Teaching Commercial Work.—Discussion of aims and methods best suited to teaching practical commercial work in part-time general continuation schools and classes. Practice in analyzing and classifying the content of such subjects for instructional purposes. Lesson planning; management. M. T. W. T. F. S., 2; 214 U. H. (3). Assistant Professor McKinney

Prerequisite: (a) A minimum of ten hours in practical commercial subjects such as accounting, salesmanship, etc.; or, (b) at least one year of practical experience; (c) Education 25, 10; Industrial Education 50.

Note—During the session of 1919 the prerequisite of Education 25 and 10 will be waived and Industrial Education 50 may be taken concurrently with 57.

S62. Organization, Administration, and Supervision of Manual Arts.—Organization, administration, and supervision of manual arts in the different grades of the elementary and secondary school. M. T. W. T. F. S., 11; 214 U. H.; (3).
Professor Crawshaw

Prerequisite: Industrial Education 60.

LIBRARY SCIENCE

Director Windsor in charge, Miss Bond, Mr. Cleavinger, Miss Boyd, Miss Taylor, Miss ————, Miss ————

The University of Illinois will conduct the following course in library training during the Summer Session of the University in 1919, beginning Tuesday, June 24.

A. Courses for College Graduates preparing for librarianship

Courses of the regular two-year curriculum are offered to college graduates who can satisfy the entrance requirements. These courses are accepted for credit toward the B. L. S. degree. Admission to these courses is conditioned on the presentation of credentials showing that the applicant holds a Bachelor's degree in arts or science from the University of Illinois or has had other equivalent training.

Application blanks for admission must be secured, and these should be filled out and sent to the Director of the School, together with such additional statements as the candidate may offer, showing his qualifications for admission. The application must be filed sufficiently early to enable the School to receive replies from librarians and others who have personal knowledge of the applicant.

Credit is reckoned in *semester hours* or simply hours. An hour is one class period a week for one semester, or the equivalent. Each class hour presupposes two hours' preparation by the student.

Description of Courses given during Summer Session, 1919

The Arabic figure indicates the number of hours of credit given the student on completion of the course.

S2a. Reference.—The aim of this course is to familiarize students with the uses of the more common reference books. These reference books are considered in groups, for example, dictionaries, encyclopedias, periodical indexes, atlasses, handbooks of statistics, handbooks of general information; reference lists are prepared by the students; a selection is made on reference books suitable for the home and for libraries of different types. M. T. W. T. F. S. (3). Miss Boyd

S16. Order, Accession and Shelf Work.—The subjects included in this course are book-buying, discounts, ordering books, checking and entering bills, the accession book and its substitutes, the shelf list, serials and continuations, exchanges, gifts, duplicates, pamphlets, clippings, the history of the copyright law. Instruction in these topics is followed by practise in the making of their respective records. T. W. T. F. (2).
Mr. Cleavinger

S18. Cataloging.—A study of dictionary cataloging is followed by a briefer study of classed cataloging. Each student makes a sample catalog of 340 representative books. Fifty-four hours of practical cataloging for the University library are included. The American Library Association Catalog rules are used as a text. M. T. W. T. F. (3). Miss Bond

B. Courses for undergraduate students and high school teachers

S12. General Reference.—This course comprises lectures on problems on the classification and arrangement of books in the library, the use of the card catalog, and a study of groups of reference books such as cyclopedias, dictionaries, indexes, and hand-

books of various sorts. It is of particular value to those planning to teach in high schools. Three times a week. (2). Miss Boyd

C. Elementary courses for librarians and library assistants

These courses, lasting six weeks of the Summer Session, are intended mainly for Illinois librarians and assistants who cannot spend a year or two in a library school.

Admission. The courses are open to librarians, library assistants, and teacher-librarians in high schools, and to others under definite appointment to such positions. There are no entrance examinations, but in all cases the completion of a four-year course in an accredited high school or its equivalent is required. No credit toward the degree of Bachelor of Library Science is given for the work done in the Summer Session, but a statement of grades is issued by the Registrar of the University. The work occupies all the working hours of the student.

Attendance in former years. Since the beginning of these elementary courses in the summer of 1911, a total of 195 librarians and assistants have been enrolled, of whom 146 were from Illinois libraries. In the summer of 1918, 30 students were in attendance, of whom 23 were from Illinois.

Outline of Course. The subjects in which instruction is given are grouped under the following heads. Two hours of study are expected of the student in preparation for each class hour.

S1. Classification, cataloging, book numbers. 30 hours

Includes practise in classifying books according to the Dewey decimal classification, and the preparation of a dictionary catalog. Five class hours a week.

S2. Reference Work. 12 hours

Study of the more important books of reference, and particularly those suited to the small public library. Twice a week.

S3. Selection of Books. 12 hours

The principles of book selection, with discussion of the literature of special subjects by members of the University faculty.

S4. Libraries and children. 12 hours

Management of children's rooms; work with schools; selection of children's literature, illustrated by the use of a good collection of children's books. Twice a week.

S5. Order, accesion, etc. 12 hours

Order, accession, shelf, and loan records; trade bibliography; the checking of periodicals; mechanical preparation of books; mending and repair. Twice a week.

S6. Library Administration and extension. 12 hours

Lectures and round table discussions of library rules, accounts, finance, extension methods and laws, and of buildings and equipment. Twice a week.

MATHEMATICS

Associate Professor Carmichael, Assistant Professor Wahlin, Dr. Lytle, Mr. Woods, Mr. Steimley, Mr. Rosenbech

The department began with the summer session of 1917 to offer at least five courses each summer for graduates and advanced undergraduates, and to vary these courses from year to year so as to enable advanced students to secure a suitable sequence of courses during four or five successive summer sessions. Three of these courses are of intermediate grade, being open to advanced undergraduates, while the

other two are primarily for graduate students. The intermediate courses given in the summer of 1917 were the following: Theory of equations and determinants, advanced calculus, and constructive geometry. Those which completed the sequence in the summer of 1918 were the following: Advanced algebra, differential equations, and solid analytic geometry.

The graduate courses offered in 1917 were: Introduction to group-theory, and projective geometry. In the summer of 1918, this group was continued by the courses following: Differential geometry, and vector methods. In the summer of 1919 this group will be further continued by the following courses: Theory of differential equations, and theory of numbers. The descriptions of courses will be found following. The courses are in many respects quite different from those having the corresponding titles and numbers in the regular sessions. They will aim to exhibit some of the characteristic elements of these fields and to emphasize the bearing of these subjects on the more elementary developments of mathematics. Teachers of mathematics will find the summer courses particularly adapted to their needs.

MATHEMATICS LIBRARY AND MODELS

The Mathematics Library now contains more than 6,000 volumes. Fifty current mathematical periodicals are received in addition to a large number of serials devoted partly to mathematics and available in the general Library. The Mathematics Library will be open to all students during certain hours of each day except Sunday, but graduate students in mathematics can secure keys which will enable them to use this library whenever the outside doors of the Natural History Building, in which it is located, are open.

A large collection of mathematical models is exhibited in cases located in the halls adjoining the mathematics recitation rooms and the Mathematics Reading Room. This collection includes models relating to the following subjects: Quadratics of all kinds, surfaces of the third and fourth order, surfaces of higher Orders and line geometry, curves in space, differential geometry, descriptive and projective geometry, analysis situs, mechanics and kinematics. It also includes devices and machines for mechanical computation, integration, and harmonic analysis.

The Mathematics Club will meet every Friday at 4 p. m. in Room 434, Natural History Building for the consideration of mathematical questions of general interest especially questions relating to the teaching and the history of mathematics. These meetings will be open to all the students who may be interested and will usually last for an hour.

Courses for Undergraduates

S2. College Algebra.—Text: Rietz and Crathorne's *College Algebra.* M. T. W.T. F. S., 10; 422 N. H. (3). Mr. STEIMLEY

Prerequisite: Two and one-half units entrance mathematics.

Equivalent: Mathematics 2.

S4. Plane Trigonometry.—Text: Rothrock's *Trigonometry.* M. T. W. T. F., 11; 434 N. H. (2). Mr. STEIMLEY

Prerequisite: Two and one-half units entrance mathematics.

Equivalent: Mathematics 4.

S6. Analytical Geometry.—Introductory plane and solid analytic geometry. Text: Wilson and Tracey's *Analytic Geometry.* M. T. W. T. F., 10 and 11; 418 N. H. (5). Mr. WOODS

Prerequisite: Mathematics 2 and 4.

Equivalent: Mathematics 6

S7. Differential Calculus.—Course for beginners. Townsend and Goodenough's *Essentials of Calculus.* M. T. W. T. F., 8 and 9; 425 N. H. (5). Mr. ROSENBACH

Prerequisite: Mathematics 6.

Equivalent: Mathematics 7.

S9. Integral Calculus.—Text: Townsend and Goodenough's *Essentials of Calculus.* M. T. W. T. F. S., 9; 419 N. H. (3) Dr. Lytle

Prerequisite: Mathematics 7.

Equivalent: Mathematics 9.

Courses for Advanced Undergraduates and Graduates

S10. Theory of Equations and Determinants.—The roots of unity; the conditions which must be satisfied in order that a giyen system of linear equations can be solved. Text: Dickson's *Elementary Theory of Equations.* M. T. W. T. F., 9; 418 N. H. (2½). Associate Professor Carmichael

Prerequisite: Mathematics 7, 9.

Equivalent: Mathematics 10 (in part).

S17. Advanced Calculus.—Derivatives and differentials. Implicit functions; functional determinants; definite and indefinite integrals; improper and line integrals. Goursat and Hedrick's *Mathematical Analysis,* Vol. I., M. T. W. T. F., 8; 422 N. H. (2½). Assistant Professor Wahlin

Prerequisite: Mathematics 7, 9.

*Equivalent*s Mathematics 17 (in part).

S35. Teachers' Course.—High school algebra and geometry; educational value; analysis of content; movements influencing content; educational principles used in teaching algebra and geometry; courses and methods of other countries; literature. Lectures, discussions and reports. M. T. W. T. F., 11; 419 N. H. (2½). Dr. Lytle

Prerequisite: Eighteen hours of college mathematics or the consent of the instructor for teachers with experience.

Equivalent: Mathematics 35 (in part).

Courses for Graduates

S113. Differential Equations.—Methods of solution; existence theorems; regular singular points; equations and periodic coefficients. M. T. W. T. F., 8; 435 N. H. (1 unit). Associate Professor Carmichael

Prerequisite: Graduate standing in mathematics.

S124. Theory of Numbers.—Congruences, binominal congruences with special reference to quadratic congruences; Diophantine analysis, M. T. W. T. F., 10; 435 N. H. (1 unit). Assistant Professor Wahlin

Prerequisite: Graduate standing in mathematics.

MECHANICAL ENGINEERING

(See also Civil Engineering, Drawing (General Engineering) and Mechanics)

Mr. Radebaugh

S81. Machine Shop Practise and Management.—Modern machine shop practice and management of metal working plants. Manufacturing methods; shop management; planning, production; routing; dispatching; inspection; time studies; shop accounting; machine operation; assembling; testing; studies of machine shop practice, methods and equipment. Text: *Departmental Notes.* M. T. W. T. F., 1-5; Machine Shop. (3). Mr. Radebaugh

Prerequisite: M. E. 75, 77, and 79.

S82. Machine Shop Practise and Management.—(Continuation of M. E. 81). Text: *Departmental Notes.* M. T. W. T. F., 1-5; Machine Shop. (3). Mr. Radebaugh

Prerequisite: M. E. 81.

MECHANICS, THEORETICAL AND APPLIED

(See also Civil Engineering, Drawing (General Engineering) and Mechanical Engineering)

Assistant Professor SEELY, Mr. PUTNAM

S20. Analytical Mechanics.—The mechanics of engineering rather than that of astronomy and physics. Fundamental concepts, equilibrium, centroids and center of gravity, friction, engineering problems, statement of conditions and use of data. M. T. W. T. F. S., 10; 202 E. H. (3). Assistant Professor SEELY

Prerequisite: Mathematics 7; registration in Mathematics 9.

NOTE—This course will include the same work as was given in T. & A. M. 20a and 20b during the second and third quarters of 1918-19.

S21. Analytical Mechanics.—Continuation of Theoretical and Applied Mechanics 20. Kinematics and kinetics. T. W. T. F., 1, 202 App. Mech. Lab. (2). Assistant Professor SEELY

Prerequisite: Mathematics 9; Theoretical and Applied Mechanics 20.

S25. Resistance of Materials.—The mechanics and properties of materials used in construction; experiments in the testing laboratory, problems; Boyd's *Strength of Materials*. M. T. W. T. F. S., 11; 202 E. H., M. W., 8-10, App. Mech. Lab. (4). Mr. PUTNAM

Prerequisite: Mathematics 9; Theoretical and Applied Mechanics 20.

NOTE—The courses T. & A. M. S21 and S25 taken together cover the same field as the courses T. & A. M. W33 and 32 given in the first and second quarters of 1918-19.

MUSIC

(For fees, see page 10)

Director ERB, Miss TREAT, Miss PHILLIPS, Mr. JOHNSON

S1. Musical History.—From the beginning of music to the Middle Ages. Collateral reference work and note books. M. W., 9; 126 U. H. (1). Director ERB

Prerequisite: The consent of the instructor.

Equivalent: Music 1 (first half; second half to be given next Summer).

S3. Harmony.—Summary and drill in scales and key, intervals, triad construction and connection; harmonization of figured bass and given melody; harmonization in two clefs. M. W., 10; 126 U. H. (1). Director ERB

Prerequisite: The Rudiments of Theory.

Equivalent: Music 3 (first half; second half to be given next Summer).

S5. Sight Singing.—Elementary Course, Music notation; scale structure; solfeggio. T. Th., 8; 126 U. H. No University credit. Miss PHILLIPS

Prerequisite: Entrance credit.

Equivalent: Music 23a (first half; second half to be given next Summer).

S6. Public School Music Methods.—Problems of supervision in the grades; study of material and technic of teaching. M. W. F., 10, 11; 126 U. H. (3). Miss PHILLIPS

Prerequisite: 2 years of sight reading and the consent of the instructor.

Equivalent: Music 25a (in part, Music 6a, as given in 1918 Summer Session, and Music 6, as above, complete the work of Music 25a).

S7. Ear Training, Elementary Course.—Formation and recognition of intervals, separately and in combinational rhythmic drill; melody making and writing. M. W., 8; 126 U. H. No university credit. Miss Phillips

Prerequisite: Entrance credit.
Equivalent: Music 21a (first half; second half to be given next Summer).

S41a-41f. Introductory Course in Piano.—Arrange hours; 102 U. H. No university credit. Miss Treat

Prerequisite: The consent of the instructor.
Equivalent: Music 41a-41f (in part).

S42-46. Piano, Collegiate Grade.—Arrange hours; 102 U. H. (1 or 2). Miss Treat

Prerequisite: Three years of piano study.
Equivalent: Music 42-46 (in part).

S47. Piano, Collegiate Grade.—For students in other schools and colleges of the University. Arrange hours; 102 U. H. (1). Miss Treat

Prerequisite: Three years of piano study.
Equivalent: Music 47 (in part).

S51a-51f. Introductory Course in Voice.—Arrange hours; 101 U. H. No university credit. Mr. Johnson

Prerequisite: The consent of the instructor.
Equivalent: Music 51a-51f (in part).

S52-56. Voice, Collegiate Grade.—For students in other schools and colleges of the University. Arrange hours; 101 U. H. (1 or 2). Mr. Johnson

Prerequisite: Three years of vocal study.
Equivalent: Music 52-56 (in part).

S57. Voice, Collegiate Grade.—For students in other schools and colleges of the University. Arrange hours; 101 U. H. (1). Mr. Johnson

Prerequisite: Three years of vocal study.
Equivalent: Music 57 (in part).

S81. Organ.—Arrange hours; 121 U. H. (1). Miss Treat

Prerequisite: Three years of piano study or the equivalent.
Equivalent: Music 81 (in part).

S83. Organ.—For students in other schools and colleges of the University. Arrange hours; 121 U. H. (1). Miss Treat

Prerequisite: Three years of piano study or the equivalent.
Equivalent: Music 83 (in part).

Students desiring to take organ will be obliged to pass without conditions the entrance examination for collegiate standing in piano.

Campus sing every Wednesday evening at 6:45. Auditorium steps.

PHILOSOPHY

Professor Daniels

Courses for Advanced Undergraduates and Graduates

S9. Political and Social Ethics.—A study of the standards and principles of human conduct in political and social relations. Rights and duties of the state and the citizen. International morality. M. T. T. F., 8; 117 L. H. (2). Professor Daniels

Prerequisite: Two years of university work or the equivalent.
Equivalent: Philosophy 9.

PHYSICAL EDUCATION FOR MEN

Director Huff, Mr. Zuppke, Mr. Gill, Mr. Jones, Mr. Schuettner

S10. Baseball.—Theory and practise in batting; base running; proper methods of fielding each position; team work and coaching methods; study of the rules; physical condition; methods of indoor practise. Lectures and practical work. M. T. 10-12, W. T. 8-10. (1½). Director Huff

S11. Track and Field Athletics.—Instruction and practical demonstration in starting, sprinting, distance running, hurdling, high and broad jumping, pole vaulting, shot putting, hammer throw, and discus; practical talks on methods of preparing contests for different athletic events; adaptions to individual peculiarities; rules of competition; study of physical condition, including endurance, speed fatigue, and all means training for condition; work assigned for the promotion, management, and officiating of games and meets. Lectures and practical work. W. T. F. S., 10-12. (1½). Mr. Gill

S12. Basketball.—Instructions will be given in basketball with the idea of fitting men to coach. The course will cover passing, goal throwing, dribbling, team play, how to condition a team, and the different styles of play used by the leading coaches. Lectures and practical work. M. T. W. T., 1-3. (1½). Mr. Jones

S13. Football.—The theoretical work will take up the rules from the standpoint of coach, players, and officials; the several styles of offense and defense with consideration of their special strengths and weaknesses; generalship and strategy. The practical work will include: training, conditioning, and player's equipment; punting, drop kicking, place kicking, kick off, and forward passing; tackling dummy and charging sled; special drills for linemen, ends, and backs; following the ball, interference, and team work; fundamental plays, freak plays, and signal systems. Lectures and practical work. M. T. F. S., 8-10. (1½). Mr. Zuppke

S14. Training.—Theories of training, massage, treatment of sprains, bruises, etc.; bandaging and first aid. Lectures and practical work. This course will be taken by all who take S10, S11, S12, or S13. F. S., 1. (½). Mr. Jones

S15. Calisthenics.—Typical lessons for corrective and responsive work. Instruction will be given in free exercises. The course will cover the use of wands, Indian clubs, and dumb-bells.

(a) Practise and instruction by demonstration and command. Emphasis to be laid on progression and exactness of execution.

(b) Theoretical work. Practise teaching. M. F. 3, T. W. 4. (⅓). Mr. Schuettner

S17. Elementary Gymnastics.—Theory and practise in elementary exercises on heavy apparatus, mats, horse, horizontal bar, rings, and parallel bars. Accuracy of form and execution emphasized. The chief purpose is to teach a large variety of rapid mass work adapted to the average class. T. W. T. 3, F. 2. (½). Mr. Schuettner

S18. Intermediate Heavy Gymnastics.—More advanced work along the same lines as course S 17. The laws of gymnastic progression will be emphasized. Nomenclature and analysis of exercises, and the use of heavy apparatus. T. W. T. 3, F. 2. (½). Mr. Schuettner

S19. Advanced Gymnastics.—Heavy apparatus. Advanced exercises on heavy apparatus; nomenclature; skill, form, and accuracy of execution emphasized. T. W. T. 3, F. 2. (½). Mr. Schuettner

S21. Gymnastic Dancing.—(a) Elements of steps, simple steps, and series of dancing steps to be given to classes in single file, pairs, and in open order. (b) Practise teaching and more advanced steps. M. Th. F. 4, Tu. 5. (½). Mr. Schuettner

S23. School Room Gymnastics.—The possibilities of exercise for elementary grades and high school will be shown. Exercises suitable for schoolroom. Practise teaching. M. F. 3, T. W. 4. (⅓). Mr. Schuettner

PHYSICAL EDUCATION FOR WOMEN

Miss Bussell, Miss ————

S1. Games.—Singing games, gymnasium games and team games. M. W. F., 2; (½). Miss Bussell

S2. Gymnastics.—Including marching tactics, the Swedish day's order, gymnastic drills and use of light apparatus. Practice in teaching. T. T., 2. (½). Miss Bussell

S3. Folk Dancing.—English country dances and dances of other nations. M. W. F., 3. (½). Miss Bussell

S4. Esthetic Dancing.—Beginning technique and simple dances. T. T., 3. Miss Bussell

S5. Swimming.—M. T. W. T. F., 10, 11, 2, 3, 4. Miss Bussell
Miss ————

PHYSICS

Professor Knipp, Assistant Professor Williams, Mr. Hyslop, Mr. Lapp, and Mr. Fritts

S1a. General Physics.—Mechanics and the Properties of Matter, Heat—Lectures with classroom demonstrations; recitations; written exercises. (For sophomores in engineering, mathematics, physics and chemistry). Text: Duff's *Physics.* M. T. W. T., 11; Lecture Room 100, Physics. (2). Professor Knipp, Mr. Hyslop, Mr. Lapp

Prerequisite: Registration in S3a; freshman mathematics.

Equivalent: The first quarter of Physics W1a for the year 1918-19.

S3a. Physical Measurements.—Laboratory experiments on mechanics, the properties of matter, and heat. Text: Schulz's *Laboratory Manual.* M. W. F., 2-4; 312 Physics. (1½). Mr. Hyslop, Mr. Lapp

Prerequisite: Physics W1a, or registration in S1a.

Equivalent: The first quarter of Physics W3a for the year 1918-19.

S7I. General Physics, Part I.—Lectures with experimental demonstrations and recitations on mechanics, including the fundamental laws of motion, forces and their effects, equilibrium, etc. (For students in Arts and Sciences). Text: Kimball's *College Physics.* M. F. W., 11; Lecture Room 119, Physics. (1½). Assistant Professor Williams, Mr. Fritts

Prerequisite: Plane Geometry and high school algebra; registration in Physics S8I. Plane Trigonometry desired.

Equivalent: S71 together with S81 are equivalent to 7a and 8a, or 9a and 10a for the first quarter of 1918-19. S7 (I, II, III) together with S8 (I, II, III) are equivalent to Physics 7a-7b, 8a-8b, or to Physics 9a-9b, 10a-10b for the college year.

S8I. Introductory Laboratory Physics, Part I.—A laboratory course in physical measurements on mechanics, properties of matter, forces, equilibrium, etc., to accompany S7I. Text: Schulz's *Laboratory Manual.* M. W. F., 2-4; 212 Physics. (1½). Assistant Professor Williams, Mr. Fritts

Prerequisite: Registration in Physics S7I.

Equivalent: See S7I.

S7II. General Physics, Part II.—Experimental lectures with recitations on electricity and magnetism. Text: *Kimball's College Physics.* T. T. S., 10; Lecture Room 100, Physics. (1½). Professor KNIPP, Mr. FRITTS

Prerequisite: See S7I.

Equivalent: See S7I.

S8II. Introductory Laboratory Physics, Part II.—Laboratory experiments in electricity and magnetism to accompany S7II. Text: Schulz's *Laboratory Manual.* M. W. F., 8-10; 212 Physics. (1½). Assistant Professor WILLIAMS, Mr. FRITTS

Prerequisite: Registration in S7II.

Equivalent: See S7I.

S7III. General Physics, Part III.—Heat, light, and sound. Text: Kimball's *College Physics.* (1½). Given in 1918; not given in 1919.

Prerequisite: Same as S7I.

Equivalent: See S7I.

S8III. Introductory Laboratory Physics, Part III.—Laboratory experiments in heat, light, and sound to accompany S7III. Text: Schulz's *Laboratory Manual.* (1½). Given in 1918; not given in 1919.

Prerequisite: Registration in Physics S7III.

Equivalent: See S7I.

S4a. Electrical and Magnetic Measurements.—Accurate measurement of resistance by commutating Wheatstone bridge, the Carey Foster bridge, and the Kelvin double bridge; insulation resistance; aperiodic and ballistic galvanometers; electric current and quantity; electric capacity. Discussions, recitations and reports. Either 4 3-hour laboratory periods, or 3 3-hour laboratory periods. T. T., 1-4; F. S., 8-11; 112 Physics. (2). Mr. HYSLOP

Prerequisite: A course in general physics and calculus.

Equivalent: This course is regularly the equivalent of the first semester of Physics 4a. For the present Summer Session it is also offered, as above stated, as the equivalent of the first quarter of Physics W4a for the year 1918-19.

S15. Electricity and Magnetism.—Lectures, recitations, and laboratory. This course is recommended to students who wish a broader and more accurate knowledge of electrical phenomena and theory than that given in the courses on general physics. Text: Brooks and Poyser's *Magnetism and Electricity.* M. W., 8; F., 8-11; 108 Physics. (1½). Mr. LAPP

Prerequisite: A course in general physics.

Equivalent: Physics 15 (in part).

S16. Heat.—Lectures and recitations on fundamental heat phenomena accompanied by laboratory experiments in thermometry, calorimetry, transmission of heat, mechanical equivalent of heat, expansion, vapor pressure, etc. This is an intermediate course recommended to students who have already had a course in general physics and desire a more extended knowledge of heat. Text: Draper's *Heat.* T. T., 8; S., 8-10; 213 Physics. (1½). Assistant Professor WILLIAMS, Mr. FRITTS

Prerequisite: A course in General Physics.

Equivalent: Physics 16 (in part).

S17. Light.—A course of lectures and recitations on reflection, refraction, interference, diffraction and polarization, followed by laboratory experiments on these phenomena, and the theory and use of optical instruments, such as telescopes, microscopes, refractometers, prism and grating spectroscopes, interferometers, etc. Text: Edser's *Light for Students.* (1½). Not given in 1919.

Prerequisite: A course in general physics.

Equivalent: Physics 17 (in part).

S18. Teachers' Course.—This course is in two parts. Part I, not given in 1919. Part II, consists of practical laboratory manipulation, such as glass blowing, minor repairs of apparatus, preparation of direction sheets, etc. W., 9-11; 213 Physics. (½).
Mr. Lapp

Prerequisite: A course in general physics, or teaching experience in physics.
Equivalent: Physics 18 (in part).

S24. Properties of Matter.—The fundamental properties of matter, weight, mass, gravitation, elacticity, viscosity, surface tension and diffusion. Lectures and recitations. Laboratory measurements including the use of the dividing engine, chronograph, etc. Text: Poynting and Thomson's *Properties of Matter.* (1½). Not given in 1919.

Prerequisite: A course in general physics.
Equivalent: Physics 24 (in part).

S21. Recent Advances and Applications in Physics.—Popular lectures, illustrated by experiments, on recent advances and applications of physics. These lectures are open to the public and may be attended by those interested. They are to be given by members of the instructional staff. One half hour credit may be obtained by students registering in the course. Brief abstracts of the lectures in addition to an examination of the main facts presented will be required. Th., 6:45-8:00 p. m.; Lecture Room 100, Physics. (½). Professor Knipp and Assistant Professor Williams in charge.

The subjects and dates follow:

The Production of High Vacua (experimental). Thur., June 26, 6:45; 100 Physics.
Professor Knipp

Elementary Electron Theory., Thur., July 2, 6:45; 100 Physics.
Assistant Professor Williams

Electric Discharge in Vacuum Tubes—the Electron (experimental). Thur., July 10, 6:45; 100 Physics.
Professor Knipp

The Audion, Its Application in Wireless Telegraphy and Telephony (experimental). Thur., July 17, 6:45; 100 Physics.
Mr. Hyslop

Experiments on the Effect of Altitude on an Aeroplane Motor (lantern). Thur., July 24, 6:45; 100 Physics.
Mr. Lapp

The Physics of Modern Photography (lantern and photographs). Thur., July 31, 6:45; 100 Physics.
Mr. Fritts

Liquefaction of Gases (experimental). Thur., August 7; 6:45; 100 Physics.
Assistant Professor Williams

A physics exhibit will be held immediately following the lecture on August 7. The laboratories, research rooms and the department shop will be open for inspection. It is planned to have a limited number of instructive experiments on exhibition.

S26. Physics Teachers' Colloquium.—A discussion in colloquium of the problems which the teacher of physics in the high school encounters, including methods of class conduction; criticisms of high school text books of physics; organization of laboratory work; selection of experiments and accompanying apparatus, etc. Part of the work will be in the shape of short papers by members of the colloquium on assigned topics. Thur. 4; 201 Physics. (½).
Professor Knipp, Assistant Professor Williams and others

Prerequisite: Enrollment in one of the physics courses.

Courses for Advanced Undergraduates and Graduates

S31. Special Problems in Advanced Physical Measurements.—Special laboratory problems such as the accurate determination of the value of H, the horizontal component of the earth's magnetic intensity; of the self-induction, L, of a coil; of the

capacity, C, of a condenser in absolute measure; the calibration of a bridge wire; the determination of e-m and v of the electron; the adjustment of an electrometer and the determination of its capacity, etc. Text: Various laboratory manuals. Arrange time. (1, 1½, or 2). Professor KNIPP, Assistant Professor WILLIAMS

Prerequisite: A course in general physics, elementary calculus.

Courses for Graduates

S131. Investigation of Special Problems.—This course is available for students who are working toward or who have taken their advanced degrees, and consists of individual special problems which will be under the general supervision of one of the professors. The work done should show originality in method, or should contribute new data in experimental investigation. Arrange time. (1, 1½, or 2).
Professor KNIPP, Assistant Professor WILLIAMS

POLITICAL SCIENCE

Assistant Professor ELLINGWOOD

Courses for Undergraduates

S1. American National Government.—Origin, structure, development and practical working of the National Government of the United States. M. T. W. T. F., 8; 317 L. H. (2½). Assistant Professor ELLINGWOOD

Prerequisite: 30 hours of university work.

Courses for Advanced Undergraduates and Graduates

S2. History of Political Theories.—Ancient, medieval and modern political thought; the political philosophy of Aristotle, Plato, Machiavelli, Hobbes, Locke, Montesquieu, Rousseau, Bentham, Austin and others. The relation of political thought to actual political development. M. T. W. T. F., 9; 317 L. H. (2½).
Assistant Professor ELLINGWOOD

Prerequisite: Six hours of political science.

PSYCHOLOGY

Assistant Professor RUCKMICH, Mr. GRIFFITH

Courses for Undergraduates

S1. Introduction to Psychology.—The facts and laws of mind. Sensation and image, perception, attention, memory, emotion, action, and thought. Lectures, illustrated with experimental demonstrations, and discussion. Text: *A Text-book of Psychology,* by E. B. Titchener. M. T. W. T. F. S., 10; 410 U. H. (3).
Assistant Professor RUCKMICH

Prerequisite: Sophomore standing or consent of the instructor.

Equivalent: Psychology 1 (in part).

S3. Elementary Laboratory Practise.—The standard experiments in the fields of sensation, feeling, attention, perception, memory and association, and action. A drill course in introspection under experimental control. Text: *Experimental Psychology, Student's Manual* (Qualitative), by E. B. Titchener. M. W. F., 8-10; 507 U. H. (1½).
Mr. GRIFFITH

Prerequisite: Registration in S1 or previous instruction in its equivalent.

Equivalent: Psychology 3 (in part).

Courses for Advanced Undergraduates and Graduates

S16. Genetic Psychology.—Instinctive responses, formation of habits, and development of mental functions in the child from birth to maturity, with special reference

to problems of education. Text: *An Introduction to Child Psychology,* by C. W. Waddle. M. T. W. T., 8; 208 U. H. (2). Assistant Professor Ruckmich

Prerequisite: Psychology 1 and one other course.

Equivalent: Psychology 16.

S21. Special Studies.—Individual investigations, for advanced students in the form of essay or experment. Some small problem will be offered for investigation in a field in which the student is interested and opportunity will be afforded to gain practise in observing in other researches under way. Hours to be arranged; 507 U. H. (1-2). Assistant Professor Ruckmich, Mr. Griffith

Prerequisite: The equivalent of psychology 1 and one other course, preferably Psychology 3.

Equivalent: Psychology 21, or in part.

PUBLIC HEALTH AND SANITATION

Dr. J. H. Beard

Courses in Public Health and Sanitation are designed especially for the instruction of teachers, social workers and others interested in the promotion of public health, sanitation, and personal hygiene. The movement for the prevention of disease and conservation of human life has recently become nation-wide and has created a great demand for the education of laymen in matters pertaining to hygiene and sanitation. The growing demand for community leaders and welfare workers—many of whom are recruited from the public school teachers—emphasizes the advisability of special training in public health organizations and administration. With these principles in view the courses herewith noted have been designed.

S1. Public Health and Sanitary Organization.—Agents that injure health, carriers of disease, contributory causes of poor health, bad health defenses, care of the body, constructive hygiene, hygiene of the home, school, and community, medical inspection of schools, visiting school nurse systems, teachers as community health promoters, rural and municipal sanitation, health surveys, sanitary inspections, public health organization, health administration. Discussions, demonstrations, illustrated lectures. M. T. W. T. F., 8; 247 N. H. (2½). Dr. Beard

S2. First Aid and Medical Emergencies.—This course is designed to meet the requirements of the Red Cross certificate. Four weeks, beginning June 24. (If there is sufficient demand, this course will be repeated during the second month of the Summer Session). Lectures, demonstrations, and practical work. M. T. W. T. F., 2; 247 N. H. (1). Dr. Beard

ROMANCE LANGUAGES

Professor Fitz-Gerald, Professor Carnahan, Dr. Shulters, Mr. Carry, Mr. Lopez

Special Conferences

Special public conferences will be held by Professors Fitz-Gerald and Carnahan for the discussion of general teaching problems. Open without credit to all students of the department.

Monday at 2:00, in 211 Lincoln Hall—Professor Carnahan

Tuesday at 2:00, in 211 Lincoln Hall—Professor Fitz-Gerald

Methods of Teaching

French S25. Methods of Teaching French.—Discussion of practical problems; practical phonetics. Text: Nitze and Wilkins, *Handbook of French Phonetics.* M. W., 10; 211 L. H. (1). Professor Carnahan

Spanish S25. Methods of Teaching Spanish.—Discussion of practical problems; practical phonetics. Text: Wilkins' *Spanish in the High Schools.* T. T., 10; 211 L. H. (1). Professor Fitz-Gerald

French

S1a. Elementary Course.—Pronunciation, grammar, reading of easy prose. Chardenal's *Complete French Course*; Talbot, *LeFrancais et sa patrie.* Section A, M., 9; T. W. T. F., 8, 9; 117 L. H. (4). Dr. SHULTERS

(Pronunciation class without credit, M, 8; 117 L. H).

Section B, M., 11; T. W. T. F., 10, 11; 117 L. H. Mr CARRY

(Pronunciation class without credit, M., 10; 117 L. H.)

Equivalent: French 1a, or one year of high school French.

S2a. Modern Prose and Drama.—Rapid reading of modern authors; syntax and composition. Guy de Maupassant, *Huit Contes Choisis;* Erchmann-Chatrian, *Le Juif Polonias;* Loti, *Pêcheur d' Islande;* Talbot's *French Composition.* T. W. T. F., 8; 218 L. H. (2). Professor CARNAHAN

Prerequisite: One year of college French, or the consent of the instructor.

Courses for Graduates

A cycle of four courses, dealing with French Drama and prose of the seventeenth, eighteenth, and nineteenth centuries, will be given in four successive summer sessions.

S121. Nineteenth Century French Drama.—Lectures and reading. M. T. W. T., 9; 216 L. H. (1 unit). Professor CARNAHAN

Prerequisite: Three years of college French or the consent of the instructor.

Spanish

S1a. Elementary Course.—Pronunciation, grammar, reading of easy prose. Moreno-Lacalle, *Elementos de Espanol;* Espinosa, *Elementary Spanish Reader.* M., 9; T. W. T. F.,8, 9; 211 L. H. (4). Mr. LOPEZ

(Pronunciation class, without credit, M., 8; 211 L. H.)

Equivalent: Spanish 1a, or one year of high-school Spanish.

S2a. Modern Spanish.—Rapid reading; review of grammar; composition. Hills and Ford, *Spanish Grammar;* Espinosa, *Advanced Spanish Composition and Conversation;* Carrion y Aza, Zaragueta; Valera, *El Pajaro Verde.* M. T. W. T., 9; 218 L. H. (2). Professor FITZ-GERALD

Prerequisite: One year of college Spanish, or the consent of the instructor.

Courses for Graduates

A cycle of four courses, dealing with Spanish drama and prose in the seventeenth and nineteenth centuries, will be given in four successive summer sessions.

S121. Seventeenth Century Spanish Prose (Novelo of the Golden Age.—Lectures and readings. M. T. W. T., 11; 212 L. H. (1 unit). Professor FITZ-GERALD

Prerequisite: Three years of college Spanish, or the consent of the instructor.

SOCIOLOGY

Professor SUTHERLAND, Mr. REUTER

Courses for Undergraduates

S1. The Principles of Sociology and Their Application to Present Problems.—Text: Hayes, E. C., *Introduction to the Study of Sociology,* Appleton Co. M. T. W. T. F. S., 8; 306 L. H. (3). Professor SUTHERLAND

Prerequisite: Junior standing, or equivalent.

Equivalent: Sociology 1.

S2. Social Psychology.—Current tendencies in the psychological interpretation of social life; ways in which the sentiments, opinions, and conduct of the members of society are shaped. M. T. W. T. F. S., 8; 308 L. H. (3). Mr. Reuter

Prerequisite: Sociology 1.

Equivalent: Sociology 2.

Courses for Advanced Undergraduates and Graduates

S8. Charities.—History of charity, the development and character of modern methods, causes and prevention of dependence, constructive philanthropy. M. T. W. T., 9; 306 L. H. (2) Professor Sutherland

Prerequisite: Consent of instructor.

Equivalent: Sociology 8 (in part).

S15. The Family.—Historical aspects of the family; its role in modern society, and problems of social policy arising therefrom. T. W. T. F., 10; 308 L. H. (2). Mr. Reuter

Prerequisite: Consent of instructor.

Equivalent: Sociology 15 (in part).

SPANISH

(See Romance Languages)

ZOOLOGY

Professor Zeleny, Dr. Faust

Courses for Undergraduates

S1. General Zoology.—Animal biology, principles of structure, function, interrelations, origin, and development of animal life; simpler and best-established generalizations in zoological theory. Lectures and recitations. Text: Kingsley, Hertwig's *Manual of Zoology,* Henry Holt & Co. M. T. W. T., 8; 229 N. H. Laboratory 9, 10, M. T. W. T., 312 N. H. (4). Five hours credit may be obtained on the completion of additional assigned work. Professor Zeleny, Dr. Faust

S2. Vertebrate Zoology and Comparative Anatomy.—Classification of the Chordata; early stages of vertebrate embryology; structure of vertebrate tissues; anatomy of systems of organs considered in respect to their function, ontogeny, and evolution in the vertebrate series; anatomical studies of types of Chordata. Recitations and laboratory. Text: *Kingsley, Comparative Anatomy of Vertebrates,* Blakiston's. Th. F. S., 9, 10, 11; (3); M. Tu., 10, 11, W. Th. F. S., 9, 10, 11, (5). 330 N. H. Professor Zeleny, Dr. Faust

Prerequisite: Zoology 1 or 1a.

Equivalent: if taken for 5 credit hours: Zoology 2.

Courses for Advanced Undergraduates and Graduates

S25. Experimental Zoology.—Experimental embryology; regeneration; heredity; variation; evolution. Laboratory; assigned reading; conference. (5). Hours to be arranged. Professor Zeleny

Prerequisite: Two years of university work including one year in Zoology.

Equivalent: Zoology 25.

Courses for Graduates

S124. Experimental Zoology.—Individual research course. (1 to 2 units). Hours to be arranged. Professor Zeleny

LEARNING AND LABOR

University of Illinois

SUMMER SESSION, 1920

GENERAL ANNOUNCEMENTS
FACULTY AND COURSES

JUNE 21 TO AUGUST 14, 1920

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UNIVERSITY OF ILLINOIS

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Calendar

Summer Session, 1920

June 21, Monday—Registration Day
August 13 and 14, Friday and Saturday—Final Examinations

First Semester, 1920-21

September 13 to 17, Monday to Friday—Entrance Examinations
September 20 and 21, Monday and Tuesday—Registration Days
September 22, Wednesday, 8 a. m.—Instruction Begins

Growth and Registration of Students

ALL DEPARTMENTS

1894-'95	810
1890-1900	2225
1904-'05	3734
1909-'10	5118
1914-'15	5956
1915-'16	6427
1916-'17	6828
1917-'18	5590
1918-'19	7157
1919-'20	8052

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Harvey Pierson Pettit, A.M., *Assistant in Mathematics*
Mary Dodds Phillips, *Instructor in Music*
Charley Lyman Porter, B.S., *Assistant in Botany*
Pitman Benjamin Potter, *Associate in Political Science*
J. Orin Powers, A.M., *Assistant in Education*
Anna May Price, *Secretary, Illinois Library Extension Commission, Springfield, Illinois*
William James Putnam, M.S., *Associate in Theoretical and Applied Mechanics*
Ellery Francis Reed, A.M., *Assistant in Sociology*
John Henry Reedy, Ph.D., *Assistant Professor of Chemistry*
Dwight Logan Reid, M.S., *Associate in Agricultural Education*
Christian Alban Ruckmick, Ph.D., *Associate Professor of Psychology*
Frederic Arthur Russell, Ph.D., *Assistant Professor of Business Organization and Operation*
Arthur James Schuettner, *Director of Men's Gymnasium, Associate in Physical Education for Men*
Robert Francis Seybolt, Ph.D., *Associate Professor of Education*
Grace Shellenberger, *Librarian, Kewanee Public Library, Kewanee, Illinois*
Jeanie Verle Steiner, A.B., *Assistant in Home Economics*
Frank Lincoln Stevens, Ph.D., *Professor of Plant Pathology*
Martin James Stormzand, A.B., B.D., *Instructor in Education*
Edwin Hardin Sutherland, Ph.D., *Assistant Professor of Sociology*
Joseph Ward Swain, Ph.D., *Instructor in History*
Charles Manfred Thompson, Ph.D., *Dean, College of Commerce and Business Administration, Professor of Economics*
Edna Almeda Treat, B.Mus., *Instructor in Piano and Organ*
Harley Jones VanCleave, Ph.D., *Assistant Professor of Zoology*
Frank Gustave Wahlen, M.S., *Assistant in Mathematics*
Royal B. Way, Ph.D., *Professor of History, Beloit College, Beloit, Wisconsin*
Bruce Weirick, A.M., *Instructor in English*
Nathan Austin Weston, Ph.D., *Professor of Economics, Acting Head of the Department*
E. A. Wildman, M.S., *Professor of Chemistry, Earlham College, Richmond, Indiana*
Elmer Howard Williams, Ph.D., *Assistant Professor of Experimental Physics*
Lewis Ward Williams, A.M., *Instructor in Education, Secretary, Appointments Committee*
Robert E. Williams, A.B., *Instructor in English, Knox College, Galesburg, Illinois*
Robert Carl Zuppke, Ph.B., *Assistant Professor of Physical Education for Men*

GENERAL STATEMENT

Location of the University of Illinois

The University of Illinois is situated in Champaign County in the eastern central part of the state between the cities of Urbana and Champaign, and within the corporate limits of the former. It is one hundred and twenty-eight miles south of Chicago, on the main Chicago-New Orleans line of the Illinois Central, the station being Champaign. The Wabash and the Cleveland, Cincinnati, Chicago & St. Louis ("Big Four" of the New York Central Lines) railroads have stations in both cities. The cities of Urbana and Champaign have together a population of 29,000.

The institution was incorporated February 28, 1867, under the name of the Illinois Industrial University. It was not until 1885 that the Legislature changed the name to the University of Illinois.

Buildings and Grounds

The land occupied by the University and its several departments embraces about two hundred and thirty-eight acres, besides a farm of about nine hundred ninety acres. The buildings at Urbana are fifty-one in number, chief of which are the Agriculture Building, Agronomy Buildings, Armory, Astronomical Observatory, Auditorium, Beef Cattle Building, Central Heating Station, Chemistry Laboratory, Physics Laboratory, Electrical Engineering Laboratory, Engineering Hall, Lincoln Hall, Farm Mechanics Building, Horticulture Building, Law Building, Library Building, Laboratory of Applied Mechanics, Mechanical Engineering Laboratory, Men's Gymnasium, Metal Shops, Natural History Building, Pumping Station, University Hall, Woman's Building, Wood Shop, Foundry, Commerce Building, Transportation Building, Gymnasium Annex, Stock Pavilion, Administration Building, Vivarium Building, Ceramics Building, and the College of Education Building. The Smith Memorial Music Building is nearing completion.

Libraries

The University library, at Urbana, contains 430,000 volumes, and receives over 3,000 periodicals; the current numbers of many of these periodicals are kept in the public reading room. The library of the State Laboratory of Natural History contains 10,200 volumes and 50,000 pamphlets.

The library is housed, for the most part, in the library building, and is for the use of the whole University. All students have the direct use of 10,700 volumes in the reading rooms, and in addition graduate and advanced students have the use of the seminar libraries. Twenty-one seminar and departmental collections are maintained in various buildings on the campus, including the six seminars in Lincoln Hall.

The Summer Session

The Summer Session of the University of Illinois for 1920 will open on June 21 and close on August 14, making a term of *eight weeks*, or one-half a semester, except for students taking courses in physical education for men, or athletic coaching, for whom the term is *six weeks* from June 21. The opening day will be devoted to registration. The final examinations will be held on Friday and Saturday of the last week.

All of the courses, except those in physical education for men, will extend through the eight weeks. Students who wish to remain for six weeks only, however, may obtain from the Director of the Summer Session a certificate for such attendance, but university credit will not be given for six-weeks' courses, except for those in physical education for men and in athletic coaching.

The number of semester hours which may be earned in each course is stated in the descriptive outline given later in this announcement. Students may register for courses aggregating eight hours or less.

Purpose

The Summer Session is an organized integral part of the University year. Though its organization is not subdivided into colleges, numerous courses are offered by departments in the Colleges of Liberal Arts and Sciences, Commerce, Agriculture, Engineering, Education and, in the School of Music and the Library School. All courses may be counted toward an A.B. or B.S. degree, or toward a master's degree, unless otherwise specified. By two Summer Sessions a regular student may reduce the eight semesters to seven, thus securing his degree a half year earlier than he would otherwise have done.

Students who have just graduated from an accredited high school may matriculate in the Summer Session and obtain credit for a half-semester. Pre-medical students are strongly urged to do this and to register for chemistry or zoology, mathematics, rhetoric, or other prescribed pre-medical subjects.

One of the primary purposes of the Summer Session is to meet the needs of the teachers in the public schools, who wish to spend a part of the summer vacation in serious study or investigation. Numerous courses are designed particularly for high school teachers, supervising officers, teachers of special subjects (agriculture, art, household science, manual training, music, industrial education, etc.), and coaches of athletic teams; graduate courses are offered for college instructors, school supervisors, and principals who are working for advanced degrees.

Admission

Admission in regular status to courses in the Summer Session for which university credit is granted is limited to students who could be regularly admitted into the colleges of the University (Liberal Arts and Sciences, or Commerce, or Engineering, or Agriculture, or Education) in which they would be registered in the winter session.

In order to meet in full the entrance requirements for any one of these colleges, a student must be a graduate of an accredited high school (or in lieu of such graduation, must pass entrance examinations in five units, including English composition, 1; algebra, 1; and three others to be designated by the University authorities in each case), and must obtain credit, either by passing entrance examinations or by presenting certificates of work completed in accredited secondary schools or other recognized schools, for 15 units of high-school work, or the equivalent, in subjects accepted for admission to the University, including in the case of each college certain subjects especially prescribed for admission to that college.

Admission to courses which give university credit, as *special students, not candidates for a degree*, may be granted to persons 21 years of age or over, subject to the general regulations of the University relating to special students.

(1) The subjects prescribed for admission to the *College of Liberal Arts and Sciences*, for the *General Curriculum*, the *Curriculum in Journalism*, and the *Pre-Legal Curriculum*, are: English, 3 units; algebra, 1 unit; plane geometry, 1 unit; laboratory science, 1 unit; Latin, Greek, French, German, or Spanish, 2 units (both units in the same language). Seven elective units are required to make up the total of 15 units.

(2) For the *College of Liberal Arts and Sciences*, for the curriculums in *Household Administration* and for *Household-Science Teachers*, the prescriptions are the same as in paragraph 1, except that the laboratory science, 1 unit must be physics. (See also paragraph 7.)

(3) For the *College of Liberal Arts and Sciences*, for the *Pre-Medical Curriculum*, the prescribed subjects are English, 3 units; algebra, 1 unit; plane geometry, 1 unit; laboratory science, 1 unit; Latin, Greek, French, or German, 2 units (both units in the same language); history or civics, 1 unit. Six elective units are required to make up the total of 15 units.

(4) For the *College of Liberal Arts and Sciences*, for the curriculums in *Chemistry* and *Chemical Engineering*, the prescribed subjects are: English, 3 units; algebra, 1 unit; plane geometry, 1 unit; laboratory science, 2 units; German or French, 2 units (both units in the same language). Six elective units are required to make up the total of 15 units.

(5) For the *College of Engineering*, the prescribed subjects are: English, 3 units; algebra, 1½ units; plane geometry, 1 unit; solid and spherical geometry, ½ unit; laboratory science, 1 unit. Eight elective units are required to make up the total of 15 units.

(6) For the *College of Agriculture*, for the *agricultural curriculums*, the prescribed subjects are: English, 3 units; algebra, 1 unit; plane geometry, 1 unit; laboratory science, 2 units. Eight elective units are required to make up the total of 15 units.

(7) For the *College of Agriculture*, for the curriculum in *Household Science*, the prescribed subjects are the same as in paragraph 6 except that one of the units of laboratory science must be physics.

(8) Students who can meet the prescriptions for any of the other colleges as outlined above may be admitted to the *College of Commerce and Business Administration.*

(9) For the *College of Education*, sixty hours of university credit except for the curriculums in *Athletic Coaching, Agricultural Education, Industrial Education*, and *Home Economics Education*, in which the prescribed subjects are the same as in paragraph 1 or 2.

(10) Admission to the eight-weeks courses in the *Library School* is conditioned on the completion of four years of college work in the Liberal Arts and Sciences.

A student who transfers from another college or university must present a letter of honorable dismissal, and transcript of record, from the institution previously attended.

Registration

Students will present themselves for registration on Monday, June 21. *The registration offices will be in the Library Building.* A representative of each department offering Summer Session courses will be present throughout the day. Students will consult with these representatives regarding the courses for which they wish to register. The study blanks will then be filled out, submitted to the Director for approval, and filed with the Registrar.

Students who wish to register for advanced degrees will first secure their study-lists at the Registrar's office, 156 Administration Building.

Fees

All fees are due upon registration.

A tuition fee of twelve dollars ($12) is required of all students in regular attendance at the Session. This entitles one to admission to regular courses and to all special lectures. It also entitles one to one lesson per week of music of collegiate grade. An extra laboratory fee is charged in some courses for materials used. Any single course, counting not more than two and one-half credit hours, may be taken for a fee of six dollars ($6) and the laboratory fee, if there be any in connection with the course taken.

In addition to the above general fees students registering in courses in applied music (voice, piano, violin, violincello, organ, or band instruments) pay special music fees as follows:

For one lesson a week	$ 3.00
For two lessons a week	5.00
Piano for practise one hour a day for the Session	1.50
Additional hours at the same rate.	
Organ for practise one hour a day for the Session	10.00

By a ruling of the Board of Trustees of the University, all high-school teachers in Illinois, and all other teachers in the State who are qualified to matriculate in the University as regular students, are entitled to Summer Session scholarships, exempting them from payment of the tuition fee. To matriculate regularly in the University, one must satisfy in full entrance requirements for some one of the colleges as outlined on page 0.

By a more recent resolution of the Board of Trustees, the scholarship privilege is extended to graduates of the Illinois State normal schools, class of 1920, and to persons (otherwise qualified) who have not been teachers the past year but who are under contract to teach in the state during the coming year.

A person who wishes to take advantage of the scholarship privilege should present to the Registrar prior to June 1, 1920 a statement from the board of education employing him, to the effect that he has either been teaching during the past year or is under contract to teach during the coming year. A normal school graduate (class of 1920) must present either a diploma or a written statement from the president of the normal school certifying that he is a graduate of this year's class.

Application blanks for scholarships may be obtained by addressing the Registrar.

The Bachelor's Degree

All the undergraduate work offered in the Summer Session carries regular university credit which may be counted, unless otherwise specified, towards the degree of Bachelor of Arts or Bachelor of Science. By careful selection of courses the graduation requirements of the College of Liberal Arts and Sciences may be met in large part by Summer Session work. In the Colleges of Engineering and Agriculture the non-technical requirements and a part of the technical engineering or agricultural requirements may be covered in the Summer Session. For the detailed requirements of the several colleges the student should consult the Annual Register of the University under the head of the college in which he is interested. *A student who is definitely a candidate for a degree* should also check over the work he has had and plan his future course in consultation with the dean or assistant dean of the college of his choice—

For the College of Liberal Arts and Sciences—Dean Babcock, Room 304, University Hall,
For the College of Commerce and Business Administration—Dean Thompson, Room 104 Commerce Building.
For the College of Engineering—Assistant Dean Jordan, Room 300, Engineering Building.
For the College of Agriculture—Assistant Dean Rankin, Room 100, Agriculture Building
For the College of Education—Dean Chadsey, Room 203 University Hall.

General Assembly

On the first Thursday of the Session, June 24, at 4 p. m., an Assembly will be held in Room 218, University Hall. All students and members of the instructional staff are requested to attend. At this time general announcements will be made concerning lectures, entertainments, etc.

Lectures, Receptions, and Entertainments

In addition to the regular class exercises, the Summer Session provides a number of incidental exercises which give an atmosphere differing but little from that of the other sessions of the year; receptions given to the students; entertainments, debates, teachers' conferences, and clubs arranged by the students themselves; games and athletic contests; and the general lectures given by members of the University departments and by men from other institutions.

The song services, which proved so successful during the recent sessions, will be continued, under the direction of Director J. L. Erb of the School of Music. All students and faculty members are cordially invited to take part in the singing on the Auditorium steps Wednesday evenings at 6:45.

Director Erb will give a series of organ recitals during the Session.

Preparations for State Teachers' Certificates

To teachers who desire to make thorough preparation for the state-certificate examinations, the Summer Session offers marked advantages, especially in connection with the professional subjects.

Among the provisions of the certificating law, enacted by the General Assembly in 1913, are the following examination requirements for the various kinds of certificates:

State Certificates

1. Four-year elementary-school certificate: Examination in English, educational psychology, and principles and methods of teaching.
2. Four-year high-school certificate: Examination in English, educational psychology, and principles and methods of teaching.
3. Four-year supervisory certificate: Requirements are the same as for the elementary-school certificate, except that the examination includes, in addition, sociology, history of education, and school organization, administration, and supervision.

County Certificates

1. Third-grade elementary-school certificate: Examination in common branches.
2. Second-grade, elementary-school certificate: Examination in common branches, pedagogy, elementary science.
3. First-grade elementary-school certificate: Examination in the common branches, three of the natural sciences; English, algebra, general history, and pedagogy.
4. High-school certificate: Examination in English, pedagogy, and six high-school subjects.
5. Supervisory certificate: Examination in English, educational psychology, history of education, and school administration.
6. Special certificate: Examination in English and principles and methods of teaching.

Examinations for the *State Elementary-School Certificate*, the *State Supervisory Certificate*, and the *State High-School Certificate* will be held at the University in July, *provided that at least fifteen applicants notify the State Superintendent prior to June 10, 1919, of their wish to take the examination here.*

The following excerpt from Circular No. 72 of the office of the State Superintendent of Public Instruction describes the new method of preparing theses:

"A thesis prepared under the direction of a teacher in a normal school, college or university either in residence or by correspondence, and accompanied by a statement from such teacher as to the method and spirit of study, the originality and thoroughness shown by the candidate in such preparation and an estimate of the thesis, will be accepted. Candidates who cannot prepare a thesis under these conditions will be given three hours at the examination to write upon the subject selected."

The instructors at the University will be glad to direct the preparation of theses to be submitted to meet the above requirements.

The following Summer Session courses are especially adapted to prepare for the professional examinations:

Education S-1a, S-1b, and S-10; Principles and Methods of Teaching.

Education S-17, S-21, and S-60 will be valuable for those preparing theses for the State Advisory Certificate.

Education S-2; History of Modern Education. (The applicant for the State Supervisory Certificate must pass an examination in the history of education.)

Education S-25; Educational Psychology. (This course, in connection with Education S-1a, should prepare for the examination in educational psychology.)

Education S-6; The Principles of High-School Education.

Attention is also called to the various courses in English and rhetoric in connection with the English requirements for all certificates.

Graduate Work in the Summer Session

In recent summer sessions the University has placed increasing emphasis on graduate courses leading to the master's degree. The departments which are closely related to high-school teaching and to educational administration have been selected as the centers of this emphasis. An attempt is made to vary the graduate offerings from year to year so that advanced students who attend the University summer after summer may continue to find acceptable work in their chosen fields.

Graduate students in the Summer Session are subject to the same scholastic requirements as those in the regular University year. *Their study lists must be approved by the Dean of the Graduate School, or his representative*, in 109 Commerce Building. Attendance on four summer sessions, or one semester and two summer sessions, is considered the equivalent of one year in residence. If in these sessions the required amount of work is properly done a master's degree may be earned in this way.

No course offered in the Summer Session may be taken for credit towards a higher degree unless it is specially described in the Summer Session circular as accepted for that purpose.

In certain cases it is possible for a graduate student to complete the thesis requirements for the master's degree to the extent of the last fourth of the total requirement for the degree under a leave of absence. This privilege may be granted in the event that the student is able

to take advantage of opportunities for research and investigation that are not afforded in the University community. Superintendents, principals, and class-room teachers frequently find it possible to carry on investigation in connection with their school work. There are, for example, numerous problems of school administration and of teaching for which the public school itself forms the only available "laboratory." Where the investigation of such problems is prosecuted under the direction of a university department, it may be possible, on individual petition beforehand, to count the work toward the master's degree.

Students working for their masters' degrees in the Summer Session must announce their thesis subjects not later than the beginning of their third session in residence.

Graduate courses in medical sciences are offered in the summer quarter between June and September at the College of Medicine of the University of Illinois in Chicago. Circulars describing the courses offered and conditions of admission and work may be obtained from the Secretary of the University of Illinois College of Medicine, Congress and Honore Streets, Chicago.

For further information about advanced degrees and the regulations therefor, the Graduate School circular should be consulted.

Vocational and Industrial Education Courses.

Courses will be offered in vocational and industrial education in preparation for teaching agriculture, home economics and the industries under the terms of the Smith-Hughes Act. For such courses in the training of teachers of agriculture, see page 00, in home economics, see page 00, in the industries, see pages 00 and 00.

"Through the enactment of the Smith-Hughes Act, State Boards for Vocational Education in each of the states accepting the provisions face the comparatively new problem of training teachers for service in the Vocational Schools or Departments of Trade and Industrial Education which have been established, or may be established in accordance with the standards of the Federal law." (Carris Memo. Federal Board for Vocational Education.) The University of Illinois, College of Education, has been appointed by the Illinois State Board of Vocational Education as an institution to give such training for the State of Illinois.

The following courses will be given in the Department of Industrial Education: Survey of Industrial Education; Teaching Related Technical Subjects; Teaching General Continuation Subjects; Teaching Shop Work; Woodwork; Furniture Construction and Methods of Teaching Woodwork.

The prerequisites for industrial courses in the Summer Session and the complete description of the courses are stated on pages 00 and 00.

Courses in Library Science.

Beginning Tuesday, June 21, 1920 and continuing for six weeks, the Library School will conduct courses to which will be admitted only high-school graduates actually employed as librarians, or library assistants, or as teacher-librarians, or under definite appointments to serve in such positions. The curriculum will meet especially the needs of workers in college, public, and high-school libraries of Illinois, and no tuition fee will be charged students entering from a library in this state; students entering from libraries in other states will pay a tuition of $12. The work is under the general direction of the faculty of the Library School, and the instruction will be given by members of the faculty, supplemented by lectures by neighboring librarians. No credit toward a degree is given for the work.

In addition to this, courses of the regular two-year curriculum are offered to college graduates who can satisfy the entrance requirement. These courses are accepted for credit to the B.L.S. degree. Admission to these courses is conditioned on the presentation of credentials showing that the applicant holds a Bachelor's degree in Arts or Sciences from the University of Illinois or has had other equivalent training.

Application blanks for admission must be secured, and these should be filled out and sent to the Director of the School together with such additional statements as the candidate may offer, showing his qualifications for admission. The application must be filed sufficiently early to enable the School to receive replies from librarians and others who have personal knowledge of the applicant.

For further information than that contained in the description of courses, (pages 28, 29, and 30), address the Director of the University of Illinois Library School, Urbana, Illinois.

Teachers' Conferences

The informal features of the Session will include a continuation of the Conferences of Teachers, Superintendents, and Principals. The importance of these round-table discussions, supplementing the more formal class exercises, has been amply demonstrated by the experience in other sessions. Members of the staff of the College of Education will organize and conduct these conferences.

Teachers' conferences have also been arranged for by the Departments of Agricultural Education, Education, English, Industrial Education, Mathematics, Physics, and Romance Languages.

Courses for Athletic Coaches

Courses for Athletic Coaches were established in connection with the Summer Session of 1914, under the general direction of George A. Huff, Director of Physical Education for men, to meet the growing demand, not only from high schools, but from colleges and other institutions as well, for trained men to direct and coach athletics. They were designed to assist, both the high-school teacher or principal who desired to become proficient in coaching one or more athletic teams and the man who intended to take up the directing of athletics or coaching as a vocation.

The courses will again be a feature of the Summer Session, occupying the first six weeks. All the courses will be taught by the men who coach the athletic teams of the University of Illinois: in baseball (Director Huff), track athletics (Mr. Harry Gill), basketball (Mr. Ralph Jones), gymnastics (Mr. Arthur J. Schuettner), football (Mr. Robert Zuppke), and group games and mass athletics (Mr. J. L. Griffith.) The athletic plant of the University is turned into a laboratory and a larger part of the instruction is given on Illinois Field.

Students may devote either their whole time, or part of their time to these courses. Detailed information regarding the courses for Athletic Coaches may be found in a special circular which will be sent on application to George A. Huff, Director, Gymnasium, Urbana, Illinois.

Athletics

Although both the men's and women's gymnasiums will be used in some parts of the regular class work in Physical Education, they are nevertheless open to students not registered in those courses, for the purpose of general recreation and exercise. Both of the gymnasiums contain swimming pools, shower baths and other forms of bath, lockers, and dressing rooms. Students are charged a small sum for a locker. The tennis courts, general athletic fields, and golf course on the University campus are open to the student body.

Board and Lodging

The fact that the larger part of the usual University community will be away at the time of the Summer Session will make lodgings and boarding accommodations plentiful. The Young Men's and Young Women's Christian Associations of the University will prepare a list of boarding places which can be recommended, and they will aid students in securing desirable locations.

Board may be obtained at from $6.50 to $7.50 a week.

Double rooms near the University, if occupied by two persons, may be had at from $8.00 to $12.00 a month.

Information

For further information on any matter connected with the Summer Session, address the Registrar of the University, or

CHARLES ERNEST CHADSEY,
DIRECTOR OF THE SUMMER SESSION
203 University Hall
Urbana, Illinois

DESCRIPTION OF COURSES

Explanation

The arrangement of subjects in the following description of courses is alphabetical. The connections of allied departments are indicated by cross references.

"S" (summer) which is prefixed to each of the courses offered is the sign used to distinguish the Summer Session courses from those having the same number offered during the regular University year. Following the description of each course will be found a statement of requirements for admission to that particular course and a statement of the equivalency of credit for such course as related to the course given in other sessions of the University. For example, the prerequisite for mathematics 9 is mathematics 7. This means that mathematics 7 must be completed before mathematics 9 may be taken. Since the Summer Session courses do not invariably cover the same ground as courses similarly numbered in the regular sessions of the University, the equivalency is sometimes noted as partial rather than full.

If a course not required for graduation is selected by fewer than five students, it may be withdrawn.

Graduate courses are numbered upwards from 100. Such courses are open only to graduate students.

Credit is reckoned for the undergraduate students in *semester hours* or simply *hours*. An *hour* represents one classroom period a week for one semester, or the equivalent in laboratory, shop, or drawing room. The number of hours for which each course counts is shown after each course by the figure in parenthesis, for example, Education S 1A. (2½)

The following abbreviations are used to designate the different buildings used during the Summer Session:

Adm.	Administration Building
Agr.	College of Agriculture
Chem.	Chemistry Laboratory
Com.	Commerce Building
E. H.	Engineering Hall
Gen.	Genetics Building
App. Mech.	Laboratory of Applied Mechanics
Law	Law Building
L. H.	Lincoln Hall
Physics	Physics Laboratory
N. H.	Natural History Building
U. H.	University Hall
Viv.	Vivarium Building
W. B.	Woman's Building
W. S.	Wood Shop

AGRICULTURE AND AGRICULTURAL EDUCATION

Assistant Professor NOLAN, Mr. COLVIN, Mr. REID, Mr. GREENE

(All courses in the College of Agriculture are designed for teacher training in vocational agriculture, meeting the provisions of the Smith-Hughes Act for Vocational Education.)

S1. General Agriculture.—Current problems in the various fields of agriculture. Short unit topics in technical agriculture. Survey of agriculture literature with special reference to the circulars and bulletins of the College of Agriculture and Experiment Station which are available for use in the school. M.T.W.T.F., 8; 122 Agr. (2½). Mr. COLVIN
(Intended for those who are not specializing in agriculture).

S2. Horticulture Projects.—A farm fruit and vegetable garden. Use of school land for a demonstration garden. Organization of projects in horticulture. The course includes field exercises involving practise in horticultural processes. M.T.W., 9; 122 Agr. (2½) Mr. COLVIN
(Laboratory periods; arrange time.)

S3. The Teaching of Agronomy.—Organization of the subject matter in agronomy for use in vocational departments of the high school. Methods in teaching agronomy. M.T.W.T.F., 8; 128 Agr. (2½). Mr. REID

S4. Farm Crop Projects.—Field work in crop projects. Organization and outline of projects for use in the vocational departments. M.W.F., 9; 128 Agr. (2½). Mr. REID
(Two laboratory periods; arrange time.)

S5. The Teaching of Animal Husbandry.—Methods of teaching animal husbandry. Organization of subject matter for teaching animal husbandry in vocational departments. M.T.W.T. F., 10; 128 Agr. (2½) Mr. GREENE

S6. Animal Husbandry Projects.—Laboratory work in projects in the field of animal husbandry. Outlines of projects for use in schools. M.W.F., 11; 128 Agr. (2½). Mr. GREENE
(Two laboratory periods; arrange time.)

S51. Special Methods in Agricultural Education.—Principles and methods in teaching vocational agriculture. M.T.W.T.F., 10; 122 Agr. (2½). Assistant Professor NOLAN

Equivalent: Education 51 (in part).

S90. Rural Education.—Conditions, needs, and agencies in rural education. M.T.W.T., 11; 122 Agr. (2½). Assistant Professor NOLAN

ART AND DESIGN

Assistant Professor LAKE

S1. Elementary Art.—Practise drawing in pencil and charchoal; perspective study and the rendering of effects in landscape, figures, and still-life. A general study of graphical expression with practise to acquire skill in freehand drawing and understanding of the principles of proportion, perspective, light, shadows, shade, and composition. M.W.F., 1, 2; 405 U. H. (2).
Assistant Professor LAKE

Equivalent: Art and Design 1.

S9. Art for the Common Schools.—The planning and execution of work in the common-school art study; design; blackboard drawing. Lectures on organization, equipment, and the administrative side of the supervisor's work. For supervisors of art, and public-school teachers. T.T., 1, 2, 3; 405 U. H. (2). Assistant Professor LAKE

S20. History of the Fine Arts.—Periods and styles of architecture, sculpture, and painting during the Italian Renaissance and to the present time. M.W.F., 3; 410 U. H. (2). Text: *Apollo* by S. Reinach; Charles Schribner's Sons, New York. Assistant Professor LAKE

Equivalent: Art and Design 20.

BOTANY

Professor Stevens, Mr. Porter

Courses for Undergraduates

S1. General Botany.—Structure, physiology, natural history, and uses of plants. Intended as a foundation for advanced study in any branch of botany, as well as giving the general knowledge of plant life which every educated person should possess. Lecture T.W.T., 9; 216 N. H. Laboratory T.W.T., 1,2,3; 216 N. H. Quiz Th. 4, 216 N.H. (4) Mr. Porter

Equivalent: 4 hours of Botany 1.

S7a. Plant Pathology.—Causal agents, symptoms, diagnosis, and treatment of plant diseases. Lecture T.W.T., 8; 120 N. H. Laboratory T.W.T., 9-12; 120 N. H. (4) Professor Stevens Mr. Porter

Prerequisite: Botany 1.

Equivalent: 4 hours of Botany 7a.

Courses for Advanced Undergraduates and Graduates

S28a or b. Taxonomy of Economic Fungi.—Advanced practise on selected groups of parasitic fungi. Time to be arranged. Botany Annex. (2-4). Professor Stevens

Prerequisite: Botany 7a; junior standing.

Equivalent: Botany 28a or 28b (in part)

Courses for Graduates

S104. Research work on Fungi.—Individual assignment of subjects and problems in field and laboratory. Time to be arranged. Botany Annex. (½-2 units). Professor Stevens

Equivalent: Botany 104 (in part).

S106. Research work on Plant Pathology.—Disease of plants, and disease agents: assigned problems. Time to be arranged. Botany Annex. (½-2 units). Professor Stevens

Equivalent: Botany 106 (in part).

BUSINESS ORGANIZATION AND OPERATION

(See also Economics)

Assistant Professor Filbey, Assistant Professor Russell, Mr. Littleton

ACCOUNTANCY

Courses for Undergraduates

S1b. Principles of Accounting.—Principles of accounting and their application in the art of bookkeeping. Accounting procedure in double entry, illustrating the use of fundamental accounts and books. Text: *Twentieth Century Bookkeeping and Accounting*, Parts I, II, and III with outfit Set III. Quiz, M.W.F., 8; Practise, T.T., 8,9; 303 Com. (3). Mr. Littleton

Prerequisite: Accountancy 1a or one unit entrance credit in bookkeeping.

Equivalent: Accountancy 1b.

S2a-S2b. Advanced Accounting.—Fundamentals of cost accounting, theory of partnership and corporation accounts, depreciation, goodwill, reserves and sinking funds; special financial statements, reading balance sheets, illustrative problems. Text: Rowe's *Cost Accounting*; Klein's *Elements of Accounting*; lectures and problems. M.T.W.T.F.S., 8,9; 312 Com. (6).
Assistant Professor FILBEY

Prerequisite: Accountancy 1a-1b; Economics 26 and 22; credit in Economics 1.

Equivalent: Accountancy 2a-2b.

S15. Teachers' Course in Bookkeeping.—Methods of approach in teaching, conduct of laboratory work; explanation of difficult transactions; logical development and treatment of columnar books, notes and drafts, interest, discount, controlling accounts, specialized books and records, inventories, and financial statements. Lectures on different systems in use. General philosophy of accounts. No specific textbook assigned, but several will be used to illustrate methods M.T.W.T., 11; 206 Com. (2). Mr. LITTLETON

Prerequisite: A course in double entry bookkeeping.

BUSINESS ORGANIZATION AND OPERATION

S19. Selling and Advertising.—Principles of salesmanship and advertising; their place in business; methods of teaching in high school; literature of the subject. Open only to high-school teachers. T.W.T.F., 10; 206 Com. (2). Assistant Professor RUSSELL

CHEMISTRY

Professor ADAMS, Associate Professor HOPKINS, Associate Professor LEWIS, Assistant Professor BEAL, (in charge), Assistant Professor REEDY, Dr. ENGLIS, Dr. BRALEY, Dr. R. M. PARR, Mr. WILDMAN, Mr. BARNES, Miss SPARKS

NOTE: All of the courses in chemistry in the Summer Session are equivalent to the courses of the same numbers given during the academic year.

Courses for Undergraduates

S1. Elementary Chemistry.—The non-metallic elements. Text: Noyes' *Textbook of Chemistry* Noyes and Hopkins' *Laboratory Exercises*, published by Henry Holt and Company. Lecture-quiz, M.T.W.T.F.S., 11; Laboratory, M.T.W.T.F.S., 8,9 or 9,10; Chem. (5).
Associate Professor HOPKINS, Dr. ENGLIS, Dr. R. M. PARR

S1a. Inorganic Chemistry.—For students who have had one year of high school chemistry. This course may be taken at the same hours as Chemistry S1, but only four hours of laboratory work are required. Chem. (3). Associate Professor HOPKINS, Dr. ENGLIS, Dr. R. M. PARR

S1b. Inorganic Chemistry.—For engineering students. This course may be taken at the same hours as Chemistry S1, but only six hours of laboratory work are required. Chem. (4).
Associate Professor HOPKINS, Dr. ENGLIS

S2a. Inorganic Chemistry and Qualitave Analysis.—Chemistry and qualitative analysis of the more common metals and inorganic compounds. Texts: Noyes' *Textbook of Chemistry*, Noyes and Smith's *Qualitative Analysis*, published by Henry Holt and Company. Lectures, M.T.W.T., 9; Quiz, M.T.W.T., 8. Laboratory M.T.W.T.F.S., 10,11; Chem. (5).
Assistant Professor REEDY, Dr. R. M. PARR

Prerequisite: Chemistry 1 or 1a.

S3a. Inorganic Chemistry and Qualitative Analysis.—For students in chemistry and chemical engineering. Texts: Noyes' *Textbook of Chemistry*, Noyes and Smith's *Qualitative Analysis*. Arrange; Chem. (5). Assistant Professor REEDY, Dr. R. M. PARR

S5a. Elementary Quantitative Analysis.—Gravimetric and volumetric methods; stoichiometrical relations, the fundamental laws of chemistry and their applications to quantitative analysis. Text: Smith's *Quantitative Chemical Analysis.* Lecture or quiz, M.T.W.T., 8; 111 Chem. Laboratory, M.T.W.T., 9-12; F., 8-12; 260 Chem. (5).

Assistant Professor BEAL, Dr. BRALEY

S5b. Quantitative Analysis.—(Continuation of Chemistry 5a). Analysis of silicates, metallic compounds, and alloys; advanced qualitative analysis. Lectures; recitations; laboratory. Treadwell-Hall's *Analytical Chemistry*, Vol. I, II. Lecture or quiz, M.T.W.T., 8; Laboratory, 9-12, (8-12 Fri.); 260 Chemistry. (5). [Will not be offered for fewer than five students.]

Assistant Professor BEAL, Dr. BRALEY

Prerequisite: Chemistry 5a or 13a.

S13a. Agricultural Analysis.—Gravimetric and volumetric analysis; analysis of fertilizers and milk. Parallel with Chemistry 5a. Smith's *Quantitative Chemical Analysis.* (For students in agriculture and household science). Lecture or quiz, M.T.W.T., 8; 111 Chem. Laboratory, M.T.W.T., 9-12; F., 8-12; 260 Chem. (5). Assistant Professor BEAL, Dr. BRALEY

Prerequisite: Chemistry 2a or 3a.

Courses for Undergraduates or Graduates

By suitable selection of courses through four consecutive summers it will be possible for persons attending the Summer Session to meet the requirements for the Master's degree, with the exception of the completion of a course in physical chemistry. It is hoped that such a course may be given in subsequent years.

S14a. Elementary Organic Chemistry.—This course should be accompanied by laboratory work, S14c. M.T.W.T.F.S., 8; 217 Chem. (3). Professor ADAMS

Prerequisite: Chemistry S2a or S3a or equivalent course.

S14b. Organic Chemistry. (second course).—Continuation of Chemistry S14a, with emphasis on special chapters. Library assignments. Not given unless elected by more than three students. M.T.W.T.F.S., 8; 217 Chem. (3). Mr. WILDMAN

Prerequisite: Chemistry S14a and S14c or equivalent.

S14c. Organic Chemistry (elementary laboratory).—Typical laboratory methods; syntheses of some of the more important organic compounds. *Four times a week*, 9-12; 250 Chem. (2).

Professor ADAMS

Prequisite: Registration in Chemistry S14a or completion of a course equivalent to S14a.

S14d. Organic Chemistry (advanced laboratory).—Synthetical preparations in organic chemistry, and quantitative organic analysis. *Four times a week*, 9-12; 250 Chem. (2).

Mr. WILDMAN

Prequisite: Registration in Chemistry S14b or completion of a course equivalent to S14b.

S15. Physiological Chemistry.—Enzymes; carbohydrates; salivary digestion; gastric digestion; fats; pancreatic digestion; intestinal digestion, bile putrefaction products; feces; blood; milk; epithelial and connective tissues; muscular tissue; nervous tissue; urine. Qualitative and quantitative work on gastric juice, blood, urine, and milk; the clinical aspect of these topics treated thoroly for the prospective student of medicine. Lectures; demonstrations; conferences; practical work; assigned reading. Mathews' *Physiological Chemistry*, 6th Ed. (Recommended but not required); Hawk's *Practical Physiological Chemistry*, 5th Ed. M.T.W.T.F., 8-12; 463 Chem. (5). Associate Professor LEWIS

Prerequisite: Chemistry 5a or 13a, and 4a-b or 9 and 9c, or equivalent.

S15. Problems of Metabolism.—Variations of metabolism in health and disease; chemistry of the ductless glands; chemical methods of diagnosis; micro-analysis of blood, tissues, and urine. Lectures; conferences; laboratory. Hawk's *Practical Physiological Chemistry*, 6th Edition. (Not given unless elected by more than four students). T.W.T., 9-12; S.; 463 Chem. (3). Associate Professor Lewis

Prreequisite: Chemistry 15 or equivalent.

S17. Teachers' Course.—Methods of teaching elementary chemistry. T.T., 10; Chem. (1). Associate Professor Hopkins

Prerequisite: 13 hours chemistry and senior or graduate standing.

S21. Qualitative Organic Analysis.—Systematic methods for the identification of pure organic compounds and mixtures. 250 Chem. (3). Four laboratory periods to be arranged in mornings. Mr. Wildman

Prerequisite: Chemistry S14b and S14d or equivalent.

S25. (formerly S5c.) **Food Analysis.**—Quantitative organic analysis; examination of food and drug products; alcohols, carbohydrates, fats, and oils, animal and vegetable foods, nitrogeneous bodies, preservatives and colors. Sherman's *Organic Analysis* and Sherman's *Food Products*, "*Bulletin* 107, *rev. U. S. Bureau of Chemistry.*" Lecture, M.T.W.T.F., 11; 204 Chem. Laboratory, M.T.W.T.F., 8-11; 218 Chem. Assistant Professor Beal

S27. Qualitative Analysis of the Rarer Elements.—The rarer elements and their compounds, identification and separation of the elements; formation, solubilities, and chemical reactions of their salts. Lectures, laboratory. Lecture, W., 9; 303 Chem.; Laboratory, Arrange. (3) Associate Professor Hopkins

S92. Chemical Literature and Reference Work.—Periods, leaders, journals; use of literature. Lectures, reports, reference work. Two periods a week; arrange (1). Miss Sparks

S104c. Advanced Organic Chemistry.—Chiefly laboratory work. The study and development of methods which are suitable for large scale production. (Limited to ten students in 1919-20). Laboratory fee, $10.00. (1 unit). Professor Adams

S105a. Advanced Physiological Chemistry.—The more difficult biochemical preparations; the use of analytical methods. Lecture and laboratory. Laboratory fee, $2.00 an hour. One to five times a week. (½ unit). Assistant Professor Lewis

S11 and S111. Research.—Advanced work for undergraduates (S11) and research work for graduates (S111), in inorganic, organic, analytical, or physiological chemistry. Arrange hours and credit before registration.

Inorganic Chemistry	Associate Professor Hopkins
Analytical Chemistry	Assistant Professor Beal, Dr. Braley
Physiological Chemistry	Associate Professor Lewis
Organic Chemistry	Professor Adams

THE CLASSICS

Latin

Professor Barton

S1. High-School Latin.—Representative readings from Caesar, Cicero, and Vergil, with discussions of material available for teachers of these authors. M.W.F., 3; 120 L.H. (1½). Professor Barton

S2. Roman Private Life.—The family, the house, the organization of society, marriage, dress, education, amusements. T.T., 3; 120 L. H. (1). Professor Barton

S3. Teachers' Course.—Special attention to problems and methods of instruction in Latin in the secondary school; considerable time will be devoted to the work of the first year; the position of Latin in the curriculums of the high schools; the purpose and results of Latin instruction. M.W.F., 2; 120 L. H. (1½). Professor Barton

For Advanced Undergraduates and Graduates

S109. Vergil.—The Aeneid. Twice a week; two credit hours or ½unit. Arrange time. Professor Barton

Prerequisite: Fifteen hours of college Latin.

ECONOMICS

(See also Business Organization and Operation)

Professor Weston, Professor Thompson, Assistant Professor Hunter, Assistant Professor Russell

Courses for Undergraduates

S2. Principles of Economics.—Text: Seager's *Principles of Economics*, second edition. M.T.W.T.F.S., Section A, 10; Section B, 11; 101 Com. (3). Assistant Professor Hunter, Assistant Professor Russell

Prerequisite: One year of university work or (for teachers) the permission of the instructor.

Equivalent: Economics 2.

S3. Money and Banking.—Principles of money; monetary system of the United States; money and prices; development and principles of credit and banking; principles of domestic and foreign exchange; banking system of the United States compared with other banking systems. Text: Holdsworth's *Money and Banking*. M.T.W.T.F., 9; 111 Com. (2½). Assistant Professor Hunter

Prerequisite: Five hour course in the principles of economics or permission of the instructor.

Equivalent: Economics 3 when used as a prerequisite.

S60. The Teaching of Economic Theory and Economic History.—A study of the content of these subjects and the various methods employed in presenting them to high school pupils. M.T.W.T.F.S., 9; 206 Com. (3). Professor Thompson

Prerequisite: High school teaching experience and the consent of the instructor.

Courses for Advanced Undergraduates and Graduates

S9. Advanced Banking.—Recent banking development in the United States; present problems and practise. M.T.W.T., 9; 101 Com. (2). Professor Weston

Prerequisite: Economics 1 and 3, junior standing.

Equivalent: Economics 9.

S20. Economic History of the United States since 1860.—M.T.W.T., 10; 111 Com. (2). Professor Thompson

Prerequisite: Economics 1 and senior standing.

Equivalent: Economics 20.

TRANSPORTATION

(See also Business Organization and Operation)

Professor Weston

Courses for Undergraduates

S1. Transportation System of the United States.—The development and economic problems of railway and other transportation in the United States. Text: Johnson and Van Metre's *Principles of Railroad Transportation*. M.T.W.T.F.S., 8; 101 Com. (3). Professor Weston

Prerequisite: Economics 1 and junior standing.

Equivalent: Transportation 1.

EDUCATION

Dean Chadsey, Professor Buckingham, Professor Cameron, Professor Griffith, Associate Professor Monroe, Associate Professor Seybolt, Assistant Professor Belting, Mr. Capps, Mr. Stormzand, Mr. Williams, Mr. Powers, Miss Bamesberger, Miss Keen

Courses for Undergraduates

S1a. The Science of Education.—Intended as an introductory course for prospective teachers, or as a general information course about the new movements in education for those who do not expect to teach. The general characteristics of the scientific method are worked out; a survey is given of the scope of the scientific method in its application to the various fields of education; and illustrative studies are made to show what the scientific method aims at in the fields of administration, principles, educational psychology, methods of teaching, and in the history of education. M.T.W.T.F., 9; 208 U. H. (2½). Mr. Stormzand

Prerequisite: Junior standing.

Equivalent: With Education S1b, this course is equivalent to Education 1 as offered during the university year. Education 1 is required of all students who secure the official recommendation of the Appointments Committee for teaching positions in secondary schools.

S1b. The Educational System.—A survey of the school system of the United States; its organization together with such topics as distribution of pupil and teaching population, money cost of education, and sources of income; its origin; its distinctive characteristics as compared with other systems; present day educational problems. M.W.F., 2; 208 U. H. (1½).

Prerequisite: Junior standing. Mr. Williams

Equivalent: With Education S1a, this course is equivalent to Education 1.

S2. History of Modern Education.—Educational theory, practise, and institutions since the Renaissance. M.T.W.T.F., 8; 113 L. H. (2½). Assistant Professor Seybolt

Prerequisite: Junior standing.

Courses for Advanced Undergraduates and Graduates

S4. Educational Administration.—The organization of educational administration in the United States with especial reference to the development of federal, state,and local unit control. The powers and duties of boards of control, the relation of superintendents to these boards, and a consideration, from the standpoint of the superintendent, of various practical problems that arise in the organization and administration of city school systems. T.W.T., 3; 202 L. H. (1½). Dean Chadsey

Prerequisite: Senior standing, or experience as a principal or superintendent.

Equivalent: Education 4 (in part).

S6a. Principles of Secondary Education.—The evolution of the free public high school; its purposes and functions in modern society; its institutional relationships; internal organization and development of the high school; physical education; extra-class activities; moral and religious education. M.W.F., 10; 202 L. H. (1½). Assistant Professor Belting

Prerequisite: Education 1 or 25, senior standing, or experience in teaching.

(Together with S6b this course is equivalent to Education 6.)

S6b. Problems of the Free Public High School.—The rise of the junior high school; the organization and administration of the junior high school; junior and senior high school curriculums; supervised study; teacher training, community high schools; state high school systems; influence on, and modification of, secondary education under the Smith-Hughes Act; continuation high school education; the small high school; compulsory high school education. T.T.S., 10; 308 L. H. (1½). Assistant Professor Belting

Prerequisite: Education 1 or 25, senior standing, or experience in teaching.

(Together with S6a this course is equivalent to Education 6.)

S10. Technic of Teaching.—Discipline and classroom management; characteristics of pupils, individual differences, motive, types of learning—motor control, reflective thinking, and appreciation; types of instruction—drill, problem solving, and the project; lesson for appreciation; supervised study; function and structure of subject-matter, measuring the results of the teaching process. M.T.W.T.F., 202 L. H., Sec. 1, 1; Sec. II, 2 (2½). Mr. Capps

Prerequisite: Education 1 or 25.

Equivalent: Education 10 (in part). Education 10 is required of all students who secure the official recommendation of the Appointments Committee for teaching positions in secondary schools.

S16. Organization and Administration of Educational Research in Public Schools.—The administrative features of research whether these are handled by a bureau or by a part-time worker. The various phases of research, the type of information each may be expected to afford, and the administrative and instructional use that can be made of the information will be presented. M.T.W.T., 8; 419 U. H. (2).

Professor Buckingham, Associate Professor Monroe

Prerequisite: Education 1 or its equivalent.

S17. The Teacher.—Preparation, selection, placement agencies, requirements for certification, salary, pensions, methods of promotion in service, professional ethics. Lectures, readings, and discussions. M.T.W.T., 9; 207 U. H. (2). Mr. Williams

S18. Theory of Educational Meaurements.—The theory and principles of the derivation and evaluation of educational tests. M.T.W.T., 8; 419 U. H. (2). Associate Professor Monroe

Prerequisite: Education 1 or 25.

Equivalent: Education 18 (in part).

S21. Units, Scales, and Standards.—The administration and interpretation of educational tests. The student will be made acquainted with the most important educational tests, both in the elementary and high-school field and with their standards. M.T.W.T., 9; 419 U. H. (2).

Associate Professor Monroe

Prerequisite: Education 1 or a satisfactory equivalent.

Equivalent: Education 21 (in part).

S23. Educational Statistics.—The practical application of statistical method to educational investigation. Methods of gathering data, calculations of statistical measure, and interpretations. M.T.W.T., 10; 419 U. H. (2). Professor Buckingham

Prerequisite: Education 1 or its equivalent.

S24. Classification, Promotion, and Guidance of Pupils.—The various administrative devices applicable to these processes, the role of educational and particularly of mental tests in these connections, the erection of norms or standards and the practise of successful school systems will be considered. M.T.W.T., 11; 419 U. H. (2). Professor Buckingham

S25. Educational Psychology.—(Introductory Course.) Instinct; habit, and the acquisition of skill; perception and memory; conception, judgment, and reasoning; applications to school subjects; lectures, readings, demonstrations. M.T.W.T., 9; 417 U. H. (2).

Professor Cameron

Prerequisite: Junior standing.

Equivalent: Education 25 (in part).

S27. Principles and Construction of High School Curriculums.—The nature of the curriculum; formal discipline and the curriculum; comparative educational values; educational aims, purposes and objectives; criteria for curriculum construction; analysis of programs of study; building of typical curriculums. T.T., 9: 202 L.H. (1). Assistant Professor Belting

Prerequisite: Education 1 or 6, senior standing, or experience in teaching.

Equivalent: Education 27 (in part).

S30. History of American Education. M.T.W.T.F., 9; 113 L. H. (2½).
Associate Professor Seybolt

S41. Principles of Vocational Education.—An introduction to the field of secondary vocational education. The psychological and sociological bases of vocational education; problems, institutions, methods, contemporary movements, and legislation; applications of research in relating industry and education. Lectures, readings, discussions. M.W.F., 2; 211 L.H. (1½).
Professor Griffith

Prerequisite: Education 1, or an equivalent satisfactory to the instructor.

S43. Mental Tests.—Laboratory drill in the technic of mental tests, including tests of sensory capacities; attention, memory; learning; suggestibility; inventiveness; systems of tests for diagnosis of mental age; general intellectual status; mental retardation. M.T.W.T., 10-12; 417 U. H. (2). Professor Cameron

Prerequisite: Education 25 or equivalent, and the consent of the instructor.

S52. The Teaching of English Composition and Literature in the High-School.—The course will be equally divided between the two phases of English teaching, and will attempt to serve the needs of both acting and prospective teachers. In composition the following topics will be taken up: planning the semester's work, the use of the textbook, making assignments, oral and written composition, and principles of theme criticism. In literature one week each will be given to the novel, the drama, the essay, and narrative and lyric poetry. Conventional methods will be dealt with in references to the most recent literature of the subject; lectures and class discussions will deal with experimental devices. M.T.W.T.F., 8; 208 U. H. (2½).
Mr. Stormzand

Prerequisite: Education 1 or equivalent, or experience in teaching.

S60. High School Administration.—The state and its relation to secondary education; administrative organization of state and local board of control; certification of teachers; salary schedules; professional preparation of teachers; administrative relationships of teachers and principals; supervision; teachers' meetings; textbooks; organizations of high school institutes and conferences; provision for individual differences; principals' reports. M.F., 3; 202 L. H. (1).
Assistant Professor Belting

Prerequisite: Education 1 or 25, senior standing, or experience in teaching.

Courses for Graduates

S104. Seminar in Problems in Educational Administration.—M., 4; 103 L. H. (½ unit).
Dean Chadsey

S106. Seminar in High-School Administration.—Discussion and investigation of the following problems: State aid to secondary education; finance, taxation, revenues, bonds; buildings; equipment; records. Tu., 4-6; 103 L. H. (½ unit). Assistant Professor Belting

S125. Seminar in Educational Psychology.—Psychology of high school subjects. W., 4-5; 417 U. H. (½ unit). Professor Cameron

ENGLISH

A. LANGUAGE AND LITERATURE

Professor Dodge, Assistant Professor Jones, Dr. Hillebrand, Dr. Bundy, Mr. Weirick

Courses for Undergraduates

S1a. Survey of English Literature.—Chaucer and his contemporaries, the popular ballads, Malory, the Renaissance, the Reformation, Elizabethan Prose, Spenser, the Elizabethan lyric, Shakespeare, Bacon, Cavalier lyrics, religious lyrics, Milton. Text: *Century Readings in English Literature* (Part I). M.T.T.F., 9; 307 U. H. (2). Assistant Professor Jones

Prerequisite: One year of college work or the equivalent.

Equivalent: First half of English 1. (Together with S1b this course covers the work of English 1. To be credited as equivalent to English 1, S1b and S1a should be taken simultaneously).

S1b. Survey of English Literature.—Bunyan and the prose of the Puritans, the Restoration, Dryden, Swift, the periodical essayists, Pope and the pseudo-classical school, DeFoe and the novelists, Thomson, Gray, Samuel Johnson, Goldsmith, Cowper, Burns. Text: *Century Readings in English Literature* (Part I). M.T.T.F., 11; 307 U. H. (2). Professor Dodge

Prerequisite: One year of college work or the equivalent.

Equivalent: Second half of English 1. (To be credited as equivalent to English 1, S1b and S1a should be taken simultaneously).

S12. American Literature.—Bryant, Irving, Cooper, Hawthorne, Emerson, Poe, Longfellow, Whittier, Lowell. Lectures, discussions, readings, and reports. Text: Page's *Chief American Poets*. T.W.T.F., 10; 202 L. H. (2). Professor Dodge

Prerequisite: One year of college work or the equivalent.

Equivalent: English 12.

S23. Shakespeare.—Midsummer Night's Dream, Richard III, Romeo and Juliet, Henry V., Much Ado, Twelfth Night, Othello, Lear, Antony and Cleopatra, Tempest. Text: *The Tudor Shakespeare*. M.T.W.T.F , 8; 315 U. H. (2½). Dr. Hillebrand

Prerequisite: One year of college work or an equivalent.

Equivalent: English 23 (in part).

S43. Tennyson and Browning.—Reading of the more important poems. Text: Globe *Tennyson*, Browning in *Oxford* Edition. *Ring and the Book* in Scribner's Modern Students' Library. M.T.W.T.F., 1; 110 L. H. (2½). Dr. Bundy

Prerequisite: Six hours of English literature or junior standing.

Equivalent: English 43 (in part).

S45. Contemporary European Drama.—The "theatre of ideas." Teutonic naturalism, and the peasant drama of England and Ireland. Modern stage-craft. Ibsen, Strindberg, Hauptman, Schnitzler, Hofmannsthal, Zola, Becque, Brieux, Hervieu, Maeterlinck, Shaw, Galsworthy, Masefield, Barker, Synge, Fitch, Moody, and others. M.T.W.T.F.S., 9; 110 L. H. (3). (Attention of those who register in this course is called to Public Speaking S10.)

Dr. Hillebrand

Prerequisite: Junior or senior standing and either ten hours of English literature or the consent of the instructor. Open to any upperclassman or graduate student with the consent of the instructor.

Equivalent: English 45.

S52. The Great Novelists of the Nineteenth Century.—Scott, Jane Austen, Dickens, Thackeray, Hawthorne, Trollope, Meredith, Hardy, Stevenson, etc. M.T.W.T.F., 2; 218 L. H. (2½).

Mr. Weirick

Prerequisite: Junior or senior standing and either ten hours of English literature or the consent of the instructor.

Equivalent: English 52.

Courses for Graduates

S101. Research in Special Periods.—Individual conferences arranged with graduate students engaged upon definite pieces of investigation. (1 unit). Dr. Hillebrand

Professor Dodge, Assistant Professor Jones

S129. English Literature from the Norman Conquest to Chaucer.—Lectures on the literature of the period and study of representative texts. M.T.W.T., 11; 218 L. H. (1 unit).

Assistant Professor Jones

B. RHETORIC

Mr. W. B. Jones, Mr. Weirick, Mr. Dolch

Courses for Undergraduates

S1. Rhetoric and Themes.—Principles of structure; grammar; punctuation; the sentence; reasoning processes. Four short themes a week and an occasional long theme. Oral and written exercises. Texts: *Handbook of Composition* and Scott and Denney's *Paragraph Writing.* M.T.W.T.F.S., two sections; A at 8, B and 9; 309 U. H. (3).

Mr. Jones, Mr. Dolch

Prequisite: Entrance credit in English.

Equivalent: Rhetoric 1.

S2. Rhetoric and Themes.—Principles of argumentation, narration, and description. Text: Scott and Zeitlin, *College Readings.* M.T.W.T.F.S., 10; 308 U. H. (3). Mr. Jones

Prerequisite: Rhetoric 1.

Equivalent: Rhetoric 2.

S3. Exposition. Themes or topics of general interest; analysis of facts and ideas, literary reviews and criticisms; informal essays. Intended for those who write correctly yet desire further practise in composition. M.T.W.T.F.S., 8; 110 L. H. (3). Mr. Weirick

Prerequisite: Rhetoric 1-2.

Equivalent: Rhetoric 3.

S10. Business Writing.—Correspondence; sales letters; practise in writing business reports and summaries. Lectures and discus sions. (Not counted toward a major in English. M.T. T.S., 11; 302 U. H. (2). Mr. Dolch

Prerequisite: Rhetoric 1-2.

Equivalent: Rhetoric 10.

C. PUBLIC SPEAKING

Mr. Williams

S1. Oral Expression.—Vocal methods, relation of the voice to the interpretation of thought. M.T.T.F., 8; 318 U. H. (2). Mr. Williams

Prerequisite: Rhetoric 1 and 2 or equivalent.

Equivalent: Public Speaking 1.

(Credit is not given for this course unless it is followed by Public Speaking 2, 10, or their equivalents).

S10. Interpretation and Dramatization.—Oral reading of types of literature; principles of stage action; staging and acting of several one act plays. (Attention of those who register in this course is called to English S23 and S45). M.T.T.F., 11; 318 U. H. (2). Mr. Williams

Prerequisite: Public Speaking 1 or equivalent.

Equivalent: Public Speaking 10.

S11. Problems in the Teaching of Oral English.—Primarily for high school teachers. M.W., 9; 318 U. H. (1). Mr. Williams

Prerequisite: The consent of the instru ctor.

ENTOMOLOGY

Assistant Professor Folsom, Dr. Glasgow

Courses for Undergraduates

S1. General Entomology.—Introduction to the study of insects in field and laboratory. Collection methods and methods for the preservation and preparation of insects for study. The structure, interrelations, origin, development, and classification of insects. Recognition of the commoner species and their work, including forms injurious to field and garden crops and to the health of man and animals. Species of economic importance will be used for illustrative material wherever pertinent. Lectures; demonstrations; laboratory; field trips; assigned reading. Text: *Entomology, with reference to its Biological and Economic Aspects*, Folsom. M.W.F., 1,2,3, and T.T., 3; 408 N. H. (2). Assistant Professor Folsom
Dr. Glasgow

S3. Economic Entomology.—Life history and habits of the commoner injurious insects. Methods of control. Lectures; demonstrations; assigned reading. Text: Sanderson's *Insect Pests of Farm, Garden, and Orchard.* M.W.F., 4; 408 N. H. (1). Dr. Glasgow

Prerequisite: May be taken only by students registered at the same time in course S1.

Equivalent: (Together with S1) Entomology 4.

S5. Insects of the Vegetable Garden.—Practical studies of habits, development, and control of insects affecting vegetables. Text: Crosby and Leonard's *Manual of Vegetable Garden Insects.* T.W.T.F., 3, 4; 104 Vivarium. (2). Assistant Professor Folsom

S9. Insect Materials for Teachers of Biology.—Educational value of the experimental method in the teaching of biology. More frequent and more extended use of the experimental method made possible by the employment ofinsect materials. Types of classroom exercises. Sources of materials. Preparation of special collections, materials, demonstrations, and experiments for illustrating the simpler generalizations of biological theory. Lectures; laboratory; field excursions; assigned reading. T.T., 1, 2; 405 N. H. (1). Dr. Glasgow

Prerequisite: One year's experience in teaching biology, or junior standing in the University. May be taken only by students registered at the same time in course S1 or who have had an equivalent of that course.

Courses for Advanced Undergraduates and Graduates

S2. Advanced Course.—Instruction to meet the purposes of the individual student. Arrange; 405 N. H. Assistant Professor Folsom

Courses for Graduates

S108. Research in Economic Entomology.—Twice a week; arrange. (1 or 2).
Assistant Professor Folsom

FRENCH.

(See Romance Languages)

GERMAN

Dr. Koller

Courses for Undergraduates

S4. Prose Reading.—Narrative prose, sight reading; composition. M.T.W.T., 3; 215 L. H. (2) Dr. Koller

Prerequisite: German 3 or two years of high school German.

Equivalent: German 4 (in part).

S6. Scientific Prose.—The rapid reading of works of a general scientific character. M.T.W.T., 2; 215 L. H. (2). Dr. Koller

Prerequisite: German 4 or three years of high school German.

Equivalent: German 6 (in part).

S16. Composition and Conversation.—M.W., 4; 215 L. H., (1). Dr. Koller

Prerequisite: Two years of University German or an equivalent.

Equivalent: German 16 (in part).

HISTORY

Professor Larson, Professor Way, Dr. Potter, Dr. Swain

Courses for Undergraduates

S1a. Europe, 1500-1763.—The foundations of modern Europe as laid in the sixteenth century; political and social development to the eve of the French Revolution. M.T.W.T., 2; 311 L. H. (2). Dr. Swain

Equivalent: The first third of History 1.

S2a. The Political and Social History of England to 1660. M.T.W.T.F.S., 8; 305 L. H. (3). Dr. Swain

Equivalent: History 2a.

S3a. American History, 1750-1815.—The colonies in the British Empire, the American Revolution, the formation of the constitution, early development under the constitution. M.T.W.T. F.S., 9; 305 L. H. (3). Professor Way

Prerequisite: Sophomore standing.

Equivalent: History 3a.

S18. The Teaching of History.—Weekly conferences with special reference to the problems of secondary schools. W., 3; 305 L. H. (1 for those who do the required reading.)
Professor Larson and others

Prerequisite: Senior standing or the consent of the instructor.

Courses for Advanced Undergraduates and Graduates

(At least junior standing is required for all the courses in this group.)

S42. The History of England and the British Commonwealth, 1868-1920.—M.T.W.F.T.S., 11; 311 L. H. (3). Professor Larson

Prerequisite: Junior standing, including one year of college work in history.

S43. The History of American Diplomacy.—The origin and history of the department of state and the American foreign service; review of the course of American foreign relations and the development of American foreign policy to 1920. M.T.W.T.F., 9; 317 L. H. (2½). (Not available for credit for students who have had Political Science 7). Dr. Potter

Prerequisite: Junior standing, including one college course in American history.

S44. The History of the Frontier in American History to 1840.—The Old West before the American Revolution; British western policy, 1763-1775; the crossing of the Alleghanies; the West in the Revolution; problems of land policy and territorial government; the settlement of the Northwest and the Southwest, 1800-1840. M.T.W.T., 2; 305 L. H. (2).
Professor Way

Prerequisite: Junior standing, including one college course in American history.

Courses for Graduates

S101. Research in American History.—Students who wish to investigate special topics will have opportunities for consultation with various members of the department. Conferences to be arranged individually. (½-1 unit).

S102. Seminary in English History.—Selected problems in the Tudor period; discussion of the technic and methods of historical investigation. M.T.T.F., 3; (½unit).

HOME ECONOMICS

Professor Handschin, Assistant Professor MacKinnon, Miss Bunch, Miss Brooks, Miss Bane, Miss Crigler, Miss Bond, Mrs. Kenney, Miss Steiner ——,——

S4. Clothing.—Textiles used in clothing; cost and care of clothing; use of patterns; remodeling; the making of clothing. Text: Baldt's *Clothing for Women* (Lippincott). Lecture and discussion, M., 2; demonstration-lecture and laboratory. W.F., 1,2,3; W. B. (2).

Mrs. Kenney,——

S5. Millinery.—Design and construction of wire, buckram, and cape net frames; covering with velvet and straw. Demonstrations and laboratory. T.T., 1,2,3; W. B. (1½).

Mrs. Kenney,——

S6a. Costume Design.—The use and misuse of fashion and possible remedies for its evils. Value of budgeting. Essentials of suitable dress. Structural design in dress—proportion, silhouette, line, workmanship, and materials. The purpose of decorative design. The fundamental principles which govern both structural and decorative design. Problems in planning the wardrobe including remodeled and double-purpose dresses. Theory of color and systems of color organizations. Selection of colors suited to peculiar types. Lecture and discussion S. 10, 11; laboratory T.T., 10, 11; W. B. (1½).

S6b. House Furnishing.—Constructive and decorative design in furniture and furnishings. The principles of rhythm, harmony, and balance as the basis for unity in house furnishing. Comparison of floor and wall coverings for durability, cost, and artistic merit. The selection and framing of pictures. The choice and arrangement of lighting fixtures both physiologic and artistic. A survey of English and French furniture and the three great art epochs which shaped it. Problems in floor plans and elevations involving the principles of design and color. Estimations of comparative cost of various types of furnishing. Assigned reading. Lecture and discussion, M. 10, 11; laboratory, W. F., 10, 11; W. B. (1½).

S11. Business of Housekeeping.—This course deals with the principles underlying the business of housekeeping, emphasizing the spending of the income, time schedules, marketing, service of meals, service in the home. Lecture, M.W.F., 10; laboratory, T. T., 10,11. (2). Laboratory fee $2.00.

Assistant Professor MacKinnon

Prerequisite: A year of general chemistry, a course in general physiology, a year of college work in foods, Economics 1. (Economics 1 may be taken parallel.)

Special Courses for Home Economics Extension Workers

Owing to the urgent call for extension workers in Home Economics, the University of Illinois offers a six weeks' course of instruction for candidates for such service. Topics to be considered are the fundamental facts regarding rural life, the needs of the rural community, survey of the economic resources of the rural community, relation of rural wealth and income to improvement programs, relation of extension agencies to rural problems, methods of extension work.

S10. Extension Course.—The application of the principles of psychology, sociology, and pedagogy in their relation to the problems of rural life and extension work; the technic of the demonstration-lecture and of the home demonstrations; the home bureau as a unifying factor in correlating the efforts of all organizations for home betterment; the relation of the county adviser to the home bureau, to the university, and to the federal department. Lectures and discussions. M.T.W.T.F.S., 8,9,2; W. B.; no credit. (Six weeks beginning June 21.)

Professor Handschin, Miss Bunch,
Miss Bane, Miss Crigler, Miss Brooks

Prerequisite: Graduation from a four years' college course in Home Economics.

INDUSTRIAL EDUCATION

Professor Griffith, Assistant Professor McKinney, Mr. Hall, Mr. Cox

S2. Woodwork.—Mastery and care of woodworking handtools, technical terminology, conventional methods of procedure. M.T.W.T.F.S., 8,9; W.S. (3). Professor Griffith, Mr. Hall

S3. Furniture Construction and Methods of Teaching Woodwork.—Construction and finishing of furniture. Use and care of wood-working machinery; woodturning. M.T.W.T.F.S., 10, 11; W. S. (3). Professor Griffith, Mr. Cox

Prerequisite: Industrial Education 2.

S50. Survey of Industrial Education.—A brief survey of the development of manual arts and industrial education in the United States as a means of determining better the functions of each. A study of the Smith-Hughes Enactment as it has to with industrial education. Illinois state plans and provisions. Method of attack in analyzing and classifying industrial content for instructional purposes; practise. M.T.W.T.F.S., 1; 211 L. H. (3). Professor Griffith

Prerequisite: Consent of the instructor.

S52. Teaching Related Technical Subjects.—Discussion of aims and methods best adapted to teaching such subjects as mathematics, science, drawing, when applied, in industrial schools and classes. Practise in analyzing and classifying the content of such subjects for instructional purposes, and in relating the same to industrial content similarly analyzed and classified Lesson planning. M.T.W.T.F.S., 2; 214 U. H. (3). Assistant Professor McKinney

Prerequisite: (a) A minimum of five hours in each and ten hours in some one of the following: College mathematics, physics, chemistry, freehand and mechanical drawing; (b) Not less than two years of teaching experience.

S54. Teaching General Continuation Subjects.—Discussion of aims and methods best adapted to teaching such subjects as industrial history, geography, economics; English; sanitation, safety, and hygiene; citizenship; as well as practical commercial subjects in general continuation part-time schools and classes. Practise in analyzing and classifying content of such subjects for instructional purposes. Lesson planning. M.T.W.T.F.S., 3; 214 U. H. (3).

Assistant Professor McKinney

Prerequisite: (a) A minimum of three hours in each and five hours in some one of the following groups: (1) Economics 7, 22, 26, 27, 1 or 2; Geology 37; (2) Rhetoric 1, 2, 3a or 3b, 10; Public Speaking 1, 2; (3) Physiology 2, 3; Physical Training, Hygiene; (4) Political Science 1, 3, 4, 11; Sociology 1. (b) Not less than two years of teaching experience.

S56. Teaching Shopwork.—Discussion of aims and methods best adapted to teaching shop-work in industrial schools and classes and on the job. Practise in analyzing and classifying trade and industrial content for effective instruction. Lesson planning; management. M.T. W.T.F.S., 2; 214 U. H. (3). Assistant Professor McKinney

Prerequisite: (a) Two years of trade or industrial experience beyond the apprenticeship; (b) completion of an elementary school curriculum.

LIBRARY SCIENCE

Director Windsor, in charge, Mr. Cleavinger, Miss Bond, Miss Boyd, Miss Price, Miss Shellenberger, Miss Murray, Miss Dempster

Eight-Weeks Courses for College Graduates

Courses of the regular two-year curriculum are offered to college graduates who can satisfy the entrance requirements. These courses are accepted for credit toward the B.L.S. degree. Admission to these courses is conditional on the presentation of credentials showing that the applicant holds a bachelor's degree in arts or science from the University of Illinois or has had other equivalent training.

Application blanks for admission must be secured. and these should be filled out and to the Director of the School, together with such additional statements as the candidate may offer, showing his qualifications for admission. The application must be filed sufficiently early to enable the School to receive replies from librarians and others who have personal knowledge of the applicant.

S3a. Selection of Books.—The principles underlying the selection of books for different types of libraries. The various aid used in book selection. Practise in the writing of annotations and reviews. The reading or careful examination of books on a wide range of subjects. M.T. T.S., 10; (2). Miss Boyd

S17. Classification and Subject Headings.—The principles of book classification, special emphasis being placed on practise in using the Dewey Decimal Classification. Subject headings are assigned in connection with classification. M.T.W.T.F.S., 9; (3). Mr. Cleavinger

S18. Cataloging.—Dictionary cataloging is followed by a briefer study of classed cataloging. Each student makes a sample catalog of representative books. The American Library Association rules are used as a text. M.T.W.T.F.S., 8; (3). Miss Bond

S20. Loan Department.—The principles underlying the relations of the library to the public brought about by the loan of books, and the character of the service to be rendered; representative loan systems suitable for various types of libraries, and rules, regulations, and practises incidental to the service. W.F., 10; (1). Mr. Cleavinger

S23a. Library Administration and Current Library Literature.—The current library periodicals, bulletins, reports, etc., are examined, and are reported upon in class. A brief consideration of the administration of small libraries, and the selection of government documents most useful to them. T.T., 11; (1). Mr. Cleavinger

Eight-weeks Course for High School Teachers

This course is accepted for credit toward the A.B. and B.S. degrees in the University and is planned to meet the needs of high-school teachers. Open to teachers and to juniors and seniors in the University.

S12. General Reference.—Lectures and problems on the arrangement and use of books in a library. A brief study of groups of English-language reference books, such as dictionaries, encyclopedias, and others of special value in the high school. Methods of teaching the use of books and the library to high-school students. M.W.F., 11; (2). Miss Boyd

Six-weeks course for High School Graduates

These courses are open only to librarians, library assistants, and teacher-librarians, and to others under definite appointment to such positions. There are no entrance examinations, but in all cases the completion of a four-year course in an accredited high school or its equivalent is required. No credit toward a degree is given for the work, but a statement of grades is issued by the Registrar of the University.

The subjects in which instruction is given are grouped under the following heads. Two hours of study are expected of the student in preparation for each class hour. These courses, taken together, occupy all the working hours of the student.

S1. Classification, Cataloging, Book Numbers.—Practise in classifying books according to the Dewey Decimal Classification, and the preparation of a dictionary catalog. *Five class hours a week.*

S2. Reference Work.—The more important books of reference, and particularly those suited to the small public library. *Two class hours a week.*

S3. Selection of Books.—The principles of book selection, with discussion of the literature of special subjects by members of the University faculty. *Two class hours a week.*

S4. Libraries and Children.—Management of children's rooms; work with schools; selection of children's literature, illustrated by the use of a good collection of children's books. *Two class hours a week.*

S5. Order, Accession, etc.—Order, accession, shelf, and loan records; trade bibliography; the checking of periodicals; mechanical preparation of books; mending and repair. *Two class hours a week.*

S6. Library Administration and Extension.—Lectures and round table discussions of library rules, accounts, finance, extension methods and laws, and of buildings and equipment. *Two class hours a week.*

MATHEMATICS

Assistant Professor CRATHORNE, Assistant Professor KEMPNER, Dr. LYTLE, Dr. KLINE
Mr. EDINGTON, Mr. PETTIT, Mr. WAHLEN

The Department offers at least five courses each summer for graduates and advanced undergraduates. These courses vary from year to year so as to enable advanced students to secure a suitable sequence of courses during four or five successive summer sessions. Three of these courses are of intermediate grade, being open to advanced undergraduates, while the other two are primarily for graduate students.

Mathematics Library and Models

The Mathematics Library now contains more than 6,000 volumes. Fifty current mathematical periodicals are received in addition to a large number of serials devoted partly to mathmatics and available in the general Library. The Mathematics Library will be open to all students during certain hours of each day except Sunday, but graduate students in mathematics can secure keys which will enable them to use this library whenever the outside doors of the Natural History Building, in which it is located, are open.

A large collection of mathematical models is exhibited in cases located in the halls adjoining the mathematics recitation rooms and the Mathematics Reading Room. This collection includes models relating to the following subjects: Quadratics of all kinds, surfaces of the third and fourth order, surface of high orders and line geometry, curves in space, differential geometry, descriptive and projective geometry, analysis situs, mechanics and kinematics. It also includes devices and machines for mechanical computation, integration, and harmonic analysis.

The Mathematics Club will meet every Friday at 4 p. m. in Room 434, Natural History Building for the consideration of mathematical questions of general interest, especially questions relating to the teaching and the history of mathematics. These meetings will be open to all the students who may be interested and will usually last for an hour.

Courses for Undergraduates

S2. College Algebra.—Text: Rietz and Crathorne's *College Algebra.*
M.T.W.T.F.S., Section A, 11; 434 N. H.; (3). Mr. EDINGTON
Section B, 11; 422 N. H.; (3). Mr. PETTIT

Prerequisite: Two and one-half units entrance mathematics.

Equivalent: Mathematics 2.

S4. Plane Trigonometry.—Text: Young and Morgan's *Trigonometry.*
M.T.W.T.F., Section A, 10; 434 N. H.; (2). Dr. LYTLE
Section B, 10; 422 N. H.; (2). Mr. PETTIT

S6. Analytical Geometry.—Introductory plane and solid analytic geometry. Text: Crawley and Evans' *Analytic Geometry.* M.T.W.T.F., 10 and 11; 418 N. H. (5) Mr. WAHLEN

Prerequisite: Mathematics 2 and 4.

Equivalent: Mathematics 6.

S7. Differential Calculus.—Course for beginners. Townsend and Goodenough's *Essentials of Calculus.* M.T.W.T.F., 8 and 9; 425 N. H. (5). Dr. KLINE

Prerequisite: Mathematics 6.

Equivalent: Mathematics 7.

S9. Integral Calculus.—Text: Townsend and Goodenough's *Essentials of Calculus.* M.T.W T.F.S., 9; 419 N. H. (3). Mr. EDINGTON

Prerequisite: Mathematics 7.

Equivalent: Mathematics 9.

Courses for Advanced Undergraduates and Graduates

S12. Advanced Algebra.—Selected topics from higher algebra, such as determinants with applications, graphical methods, fundamental theorem of algebra. M.T.W.T.F., 9; 418 N. H. (2½). Assistant Professor KEMPNER

Prerequisite: Mathematics 7-9.

S16. Differential Equations.—Total and partial differential equations. Applications to geometry and physics. Special study of linear equations, and in particular certain forms that appear frequently in physics. M.T.W.T.F., 10; 425 N. H. (2½).

Assistant Professor CRATHORNE

Prerequisite: Mathematics 7-9.

S35. Teachers' Course.—High-school algebra and geometry; educational value; analysis of content; movements influencing content; educational principles used in teaching algebra and geometry; courses and methods of other countries; literature. Lectures, discussion, and reports. M.T.W.T.F., 11; 419 N. H. (2½). Dr. LYTLE

Prerequisite: Eighteen hours of college mathematics or the consent of the instructor for teachers with experience.

Equivalent: Mathematics 35 (in part).

Courses for Graduates

S129. Theory of Statistics.—General methods of statistical investigation with special attention to the underlying mathematical theory. M.T.W.T.F., 8; 207 Com. (1 unit).

Assistant Professor CRATHORNE

S102. Functions of a Complex Variable.—Single valued functions. M.T.W.T.F., 10; 435 N. H. (1 unit). Assistant Professor KEMPNER

MECHANICS, THEORETICAL AND APPLIED

Mr. ENSIGN, Mr. PUTNAM

S20. Analytical Mechanics.—Statics, kinematics, centroids, and friction. Maurer's *Technical Mechanics.* M.T.W.T.F.S., 10; 202 E. H. (3). Mr. ENSIGN

Prerequisite: Mathematics 7, registration in Mathematics 9.

S21. Analytic Mechanics.—Kinetics. Maurer's *Technical Mechanics.* T.W.T.F., 1; 202 E.H. (2). Mr. ENSIGN

Prerequisite: Mathematics 9; Theoretical and Applied Mechanics 20.

S25. Resistance of Materials.—The mechanics and properties of materials used in construction; experiments in testing laboratory; problems. Merriman's *Mechanics of Materials.* Quiz. M.T.W.T.F.S., 11; 202 L.A.M.; laboratory M.W., 8-10; L.A.M. (4). Mr. PUTNAM

Prerequisite: Mathematics 9; Theoretical and Applied Mechanics 20.

MUSIC

Director Erb, Miss Treat, Miss Phillips, Mr. Johnson

S1. Musical History.—From the Middle Ages to the Eighteenth Century. Collateral reference work and note books. T.T., 9; 126 U.H. (1). Director Erb.

Prerequisite: The consent of the instructor.

Equivalent: Music 1 (second half).

S3. Harmony.—Summary and drill in scales and key, intervals, triad construction, and connection; harmonization of figured bass and given melody; harmonization in two clefs. T.T., 10; 126 U. H. (1). Director Erb

Prerequisite: The Rudiments of Theory.

Equivalent: Music 3 (second half).

S5a. Sight Singing. Elementary Course.—Music notation; scale structure; solfeggio. T.T., 8; 126 U. H. No university credit. Miss Phillips

Prerequisite: Entrance credit.

Equivalent: Music 23a (second half).

S6a. Public School Music Methods.—Problems of supervision in the High School; study of material and technic of teaching. M.W.F., 9, 10; 126 U. H. (3). Miss Phillips

Prerequisite: 2 years of sight reading and the consent of the instructor.

Equivalent: Music 25a (in part) Music 6, as given in 1919 Summer Session, and Music 6a, as above, complete the work of Music 25a.

S7a. Ear Training, Elementary Course.—Formation and recognition of intervals, separately and in combinational rhythmic drill; melody making and writing. M.W., 8; 126 U. H. No university credit. Miss Phillips

Prerequisite: Entrance credit.

Equivalent: Music 21a (second half).

S41a-41f. Introductory Course in Piano.—Arrange hours; 102 U. H. No university credit.

Prerequisite: The consent of the instructor. Miss Treat

Equivalent: Music 41a-41f (in part).

S42-46. Piano, Collegiate Grade.—Arrange hours; 102 U. H. (1 or 2). Miss Treat

Prerequisite: Three years of piano study.

Equivalent: Music 42-46 (in part).

S47. Piano, Collegiate Grade.—For students in other schools and colleges of the University. Arrange hours; 102 U. H. (1). Miss Treat

Prerequisite: Three years of piano study.

Equivalent: Music 47 (in part).

S51a-51f. Introductory Course in Voice.—Arrange hours; 101 U. H. No university credit.

Prerequisite: The consent of the instructor. Mr. Johnson

Equivalent: Music 51a-51f (in part).

S52-56. Voice, Collegiate Grade.—Arrange hours; 101 U. H. (1 or 2). Mr. Johnson

Prerequisite: Three years of vocal study.

Equivalent: Music 52-56 (in part).

S57. Voice, Collegiate Grade.—For students in other schools and colleges of the University. Arrange hours; 101 U. H. (1). Mr. Johnson

Prerequisite: Three years of vocal study.

Equivalent: Music 57 (in part)

S81. Organ.—Arrange hours; 121 U. H. (1). Miss Treat

Prerequisite: Three years of piano study or the equivalent.

Equivalent: Music 81 (in part).

S83. Organ.—For students in other schools and colleges of the University. Arrange hours; 121 U. H. (1). Miss Treat

Prerequisite: Three years of piano study or the equivalent.

Equivalent: Music 83 (in part).

Students desiring to take organ will be obliged to pass without conditions the entrance examination for collegiate standing in piano.

Campus sings Wednesday evenings at 6:45, Auditorium steps.

PHILOSOPHY

Professor Daniels

Courses for Advanced Undergraduates and Graduates

S9. Political and Social Ethics.—The standards and principles of human conduct in political and social relations. Rights and duties of the state and the citizen. International morality. M.T.T.F., 8; 120 L. H. (2). Professor Daniels

Prerequisite: Two years of university work or the equivalent.

Equivalent: Philosophy 9.

PHYSICAL EDUCATION FOR MEN

Director Huff, Assistant Professor Zuppke, Assistant Professor Griffith, Mr. Gill, Mr. Jones, Mr. Schuettner

S10a and S10b. Baseball.—Theory and practise in batting; base-running; proper methods of fielding each position; team work and coaching methods; study of the rules; physical condition; methods of indoor practise.

S10a. Theory.—For the benefit of students who do not desire the practical work in baseball the course is divided so they may take the theory only. M., 1-3; (¾). Director Huff

S10b. Theory and Practise.—The students wishing to enroll in both theory and practise may do so. M.T.W.T., 1-3. (1½). Director Huff

S11. Track and Field Athletics.—Instruction and practical demonstration in starting, sprinting, distance running, hurdling, high and broad jumping, pole vaulting, shot putting, hammer throw, and discus; practical talks on methods of preparing contestants for different athletic events; adaptations to individual peculiarities; rules of competition; study of physical condition, including endurance, speed, fatigue, and all means training for condition; work is assigned for the promotion, management, and officiating of games and meets. Lectures and practical work. W.T.F.S., 10-12. (1½). Mr. Gill

S12. Basketball.—Instruction will be given in basketball with the idea of fitting men to coach. The course will cover passing, goal throwing, dribbling, team play, how to condition a team, and the different styles of play used by the leading coaches. Lectures and practical work. M.T. W. T., 8-10; (1½). Mr. Jones

S13. Football.—The theoretical work will take up the rules from the standpoint of coach-players, and officials; the several styles of offense and defense with consideration of their special strengths and weaknesses; generalship and strategy. The practical work will include: training, conditioning, and player's equipment; punting, drop kicking, place kicking, kick off, and for, ward passing; tackling dummy and charging sled; special drills for linemen, ends, and backs; following the ball, interference, and team work; fundamental plays, freak plays, and signal systems. Lectures and practical work. M.T., 10-12, F.S., 8-10. (1½). Mr. Zuppke

S14. Training.—Theories of training, massage, treatment of sprains, bruises, etc.; bandaging and first aid. Lectures and practical work. This course should be taken by all who take S10, S11, S12, or S13. F.S., 1. (½). Mr. Jones

S15. Calisthenics.—(Free Exercises). System, value, method, and progression. Typical lessons for corrective and responsive work. The use of wands, clubs, and dumb-bells. Emphasis to be laid on progression and method of presenting material. The simplest and most explanatory terminology. Theoretical and practical work. M.T.W.T., 3; (½). Mr. Schuettner,

S17. Gymnastics.—Theory and practise in elementary exercises on heavy apparatus; mats, horse, horizontal bar, rings, and parallel bars. Accuracy of form and execution emphasized. The chief purpose is to teach a large variety of rapid mass work adapted to the average class. The laws of gymnastic progression. Nomenclature and analysis of exercises. Theory and practise. M.T.W.T., 4. (½). Mr. Schuettner

S19. Administration and Organization.—Including lectures on purposes of physical education, methods, and tests; organization of a department, administration, paper work; two hours a week practical work on organization of group games and mass athletics. M.T.W.T., 5; F., 4-6; (1¾). Mr. Griffith

S21. Gymnastic Dancing.—System, progression, and method of presenting gymnastic dance steps for class or individual instruction. Theory, personal proficiency, and practise teaching. F.S., 2-4. (½). Mr. Schuettner

S23. School Room Calisthenics.—(Free Exercises).—For elementary grades and high schools, System, value, method and progression. Simplest and most explanatory terminology. Exercises suitable for schoolroom. Theory and practise. M.T.W.T., 3; (½). Mr. Schuettner

PHYSICAL EDUCATION FOR WOMEN

Director Freer, Miss Hoover

S1. The Teaching and Coaching of Games.—M.W.F., 2. (½) Miss Freer

S2. Gymnastics.—T.T., 2. (½). Miss Freer

S3. Singing Games and Folk Dances.—M.W.F., 3. (½). Miss Freer

S4. Advanced Folk Dancing.—T.T., 3. (½). Miss Freer

S5. Swimming.—M.T.W.T.F., 10, 11, 2, 3, 4. Miss Hoover

PHYSICS

Assistant Professor Williams, Mr. Fazel, Mr. Hill, Mr. Lapp, Mr. Colmey

S7I. General Physics, Part I.—Lectures with experimental demonstrations and recitations on mechanics, including the fundamental laws of motion, forces and their effects, equilibrium, etc. (For students in Arts and Sciences). Text: Kimball's *College Physics*. M.W.F., 10; Lecture Room, 100 Physics. (1½). Assistant Professor Williams, Mr. Colmey

Prerequisite: Plane Geometry and high-school algebra; registration in Physics S8I. Plane Trigonometry desired.

Equivalent: S7 (I, II, III) together with S8 (I, II, III) are equivalent to Physics 7a-7b, 8a-8b, or to Physics 9a-9b, 10a-10b for the college year.

S8I. Introductory Laboratory Physics, Part I.—A laboratory course in physical measurements on mechanics, properties of matter forces, equilibrium, etc., to accompany S7I. Text: Schulz's *Laboratory Manual.* T.T.S., 10-12; 212 Physics. (1½). Mr. Hill, Mr. Colmey

Prerequisite: Registration in Physics S7I.

Equivalent: See S7I.

S7II. General Physics, Part II.—Experimental lectures with recitations on electricity and magnetism. Text: Kimball's *College Physics.* T.T.S., 9; Lecture Room, 119 Physics. (1½). Mr. Fazel

Prerequisite: See S7I.

Equivalent: See S7I.

S8II. Introductory Laboratory Physics, Part II.—Laboratory experiments in electricity and magnetism to accompany S7II. Text: Schulz's *Laboratory Manual.* M.W.F., 8-10; 212 Physics. (1½). Mr. Colmey

Prerequisite: Registration in S7II.

Equivalent: See S71.

S7III. General Physics, Part III.—Heat, light, and sound. Text: Kimball's *College Physics.* M.W.F., 11; Lecture Room, 119 Physics. (1½). Mr. Hill

Prerequisite: Same as S7I.

Equivalent: See S7I.

S8III. Introductory Laboratory Physics, Part III.—Laboratory experiments in heat, light, and sound to accompany S7III. Text: Schulz's *Laboratory Manual.* M.W.F., 2-4; 212, Physics. (1½). Mr. Hill

Prerequisite: Registration in Physics S7III.

Equivalent: See S7I.

S4a. Electrical and Magnetic Measurements.—Accurate measurement of resistance by commutating Wheatstone bridge, the Carey Foster bridge, and the Kelvin double bridge; insulation resistance; aperiodic and ballistic galvanometers; electric current and quantity; electric capacity. Discussions, recitations, and reports. Four 3-hour laboratory periods, M.T.T.F., 1-4; 112 Physics. (2). Mr. Fazel

Prerequisite: A course in general physics and calculus.

Equivalent: This course is the equivalent of the first semester of Physics 4a.

S15. Electricity and Magnetism.—Lectures, recitations, and laboratory. This course is recommended to students who wish a broader and more accurate knowledge of electrical phenomena and theory than that given in the courses on general physics. Text: Brooks and Poyser's *Magnetism and Electricity.* M.W., 8; F., 8-11; 108 Physics. (1½). Mr. Lapp

Prerequisite: A course in general physics.

Equivalent: Physics 15 (in part).

S16. Heat.—Lectures and recitations on fundamental heat phenomena accompanied by laboratory experiments in thermometry, calorimetry, transmission of heat, mechanical equivalent of heat, expansion, vapor pressure, etc. This is an intermediate course recommended to students who have already had a course in general physics and desire a more extended knowledge of heat. Text: Draper's *Heat.* T.T., 8; S., 8-11; 213 Physics. (1½.) Mr. Lapp

Prerequisite: A course in general physics.

Equivalent: Physics 16 (in part).

S18. Teacher's Course.—Practical laboratory manipulation, such as glass blowing, minor repairs of apparatus, preparation of direction sheets, etc. Th., 1-4; 213 Physics. (½). Mr. Lapp

Prerequisite: A course in general physics, or teaching experience.

Equivalent: Physics 18 (in part).

S21. Recent Advances and Applications in Physics.—Popular lectures, illustrated by experiments, on recent advances and applications of physics. These lectures are open to the public and may be attended by those interested. They are to be given by members of the instructional staff and others. One half hour credit may be obtained by students registering in the course. Brief abstracts of the lectures in addition to an examination of the main facts presented will be required. Th., 6:45-8:00 p. m.; Lecture Room 100 Physics. (½).

Assistant Professor WILLIAMS in charge.

The subjects and dates follow:

The Role of the Vacuum Tube in Modern Physics. (experimental). Thurs., June 24, 6:45; 100 Physics. Professor KNIPP

Some Everyday Applications of Acoustics. Thurs., July 1, 6:45; 100 Physics. Professor WATSON

Graphic Analysis of Sound Waves. Thurs., July 8, 6:45; 100 Physics. Mr. LAPP

Physical Methods in Astronomy. Thurs., July 15, 6:45; 100 Physics. Professor STEBBINS

Einstein's Theories of the Relativity of Motion. Thurs., July 22, 6:45; 100 Physics. Mr. FAZEL

Electrons and Matter. Thurs., July 29, 6:45; 100 Physics. Mr. HILL

Liquid Air and its Properties (experimental). Thurs., Aug. 5, 6:45; 100 Physics. Assistant Professor WILLIAMS

A physics exhibit will be held immediately following the lecture on August 5. The laboratories, research rooms, and the department shop will be open for inspection. It is planned to have a number of instructive experiments on exhibition.

S26. Physics Teachers' Colloquium.—A discussion in colloquium of the problems which the teacher of physics in the high school encounters, including methods of class conduction; criticisms of high school text books of physics; organization of laboratory work; selection of experiments and accompanying apparatus, etc. Part of the work will be in the shape of short papers by members of the colloquium on assigned topics. Tues., 4; 201 Physics. (½).

Assistant Professor WILLIAMS and others

Prerequisite: Enrollment in one of the physics courses.

Courses for Advanced Undergraduates and Graduates

S31. Special Problems in Advanced Physical Measurements.—Special laboratory problems such as the accurate determination of the coefficient of viscosity of liquids and gases; of the elastic constants of metals; of the coefficient of self-induction, L, of a coil; of the capacity, C, of a condenser in absolute measure; the calibration of a bridge wire; the use of a dividing engine, etc. Text: Various laboratory manuals. Arrange time. (1, 1½, 2).

Assistant Professor WILLIAMS

Prerequisite: A course in general physics, elementary calculus.

Courses for Graduates

S131. Investigation of Special Problems.—This course is available for students who are working toward or who have taken their advanced degrees, and consists of individual special problems which will be under the general supervision of one of the professors. The work done should show originality in method, or should contribute new data in experimental investigation. Arrange time. (1, 1½, or 2). Assistant Professor WILLIAMS

POLITICAL SCIENCE

Associate Professor MATHEWS, Dr. POTTER

S1. American National Government.—Historical development, organization, powers, limitations, and practical working of the national government of the United States. M.T.W.T.F., 2; 317 L. H. (2½). Associate Professor MATHEWS

Prerequisite: Thirty hours of university work.

S16. Government of Illinois.—The commonwealth and the nation; constitutional development; organization and functions of state and local governments; civil service reform; methods, and agencies of popular control in public affairs; the constitutional convention of 1920. M.T.W.T.F., 3; 317 L. H. (2½). Associate Professor MATHEWS

Prerequisite: Thirty hours of university work.

S22. Comparative European Government.—The political forms and practises of Great Britain, France, and Switzerland; the new political system of Germany and of political organization and practise in Russia since 1917. M.T.W.T.F., 8; 317 L. H. (2½). Dr. POTTER

PSYCHOLOGY

Associate Professor RUCKMICK, Dr. GRIFFITH

Courses for Undergraduates

S1. Introduction to Psychology.—The facts and laws of mind. Sensation and image, perception, attention, memory, emotions, action, and thought. Lectures, illustrated with experimental demonstrations, and discussion. Text: *Brevity Book on Psychology* by C. A. Ruckmick. M.T.W.T.F., 10; 410 U. H. (2½). Associate Professor RUCKMICK

Prerequisite: Sophomore standing or consent of the instructor.

Equivalent: Psychology 1 (in part).

S2. General Psychology.—The genetic inheritance of mind; relations of psychology to the physiological, medical, biological, and social sciences; habit, instinct, illusion, hallucination, dream, and other special problems; abnormal psychology; applications of psychology to the arts, professions, and industries. Text: *General Psychology*, by W. S. Hunter. M.T.W.T., 8; 410 U. H. (2). Associate Professor RUCKMICK

Prerequisite: Psychology 1 or the equivalent.

Equivalent: Psychology 2 (in part).

Courses for Advanced Undergraduates and Graduates

S13. Minor Problems.—Individual investigations in the form of essay or experiment. Some small problem will be offered for investigation in a field in which the student is interested and opportunity will be afforded to gain practise in observing in other researches under way. Hours to be arranged; 507 U. H. (1-2). Associate Professor RUCKMICK, Dr. GRIFFITH

Prerequisite: The equivalent of Psychology 1 and one other course, preferably training in elementary laboratory experiments.

Equivalent: Psychology 13, or in part.

S21. Advanced Laboratory.—Special studies for students who have had the intermediate laboratory practise. Whenever practicable, researches will be suited to the individual requirements of the student. Hours to be arranged; 507 U. H. (1-2).

Associate Professor RUCKMICK, Dr. GRIFFITH

Prerequisite: Psychology 13 or the equivalent.

Equivalent: Psychology 21, or in part.

ROMANCE LANGUAGES

Professor Oliver, Professor Fitz-Gerald, Dr. Hamilton, Mr. Carry, Mr. Lopez

FRENCH

S1a. Elementary Course.—Pronunciation, grammar, reading of easy prose. Text: Aldrich and Foster: *Elementary French* (Ginn). Section A; T.W.T.F., 8,9; 117 L. H. (4). Dr. Hamilton
Section B: T.W.T.F., 10,11; 117 L. H. (4). Mr. Carry

Equivalent: French 1a or one year of high school French.

S2a. Modern Prose and Drama.—Rapid reading of modern authors; review of grammar; composition and syntax. About, *La Mère de la Marquise, et La Fille du Chanoine* (Ginn); Pailleron, *Le Monde où l'on s'ennuie* (Heath); Augier, *Le Gendre de Monsieur Poirier* (Heath); Levi's *French Composition. A Trip to Paris* (Holt). T.W.T.F., 8; 218 L. H. (2).

Professor Oliver

Note: Students who have had French S2a in a previous summer session with different reading will be admitted to this course for full credit, but must do additional work outside the class.

Prerequisite: One year of college French or the consent of the instructor.

Equivalent: French 2a (in part).

S7a. Intermediate Composition and Conversation.—Study and practise of idiomatic expression in speaking and writing. T.W.T.F., 9; 113 L. H. (2). Mr. Carry

Prerequisite: Two years of French or the consent of the instructor.

Equivalent: French 7a.

S9a. The French Novel from 1850 to the Present Day.—Flaubert; de Goncourt; Maupassant; Daudet; Bourget; France; Loti; Bordeaux. Lectures. Outside reading. Reports. T.W.T.F., 11; 211 L. H. (2). Dr. Hamilton

Prerequisite: Two years of college French and the consent of the instructor.

S25. Methods of Teaching French.—Discussion of the teacher's preparation, the best methods of instruction, and classroom problems. Practical phonetics. M.W., 10; 218 L. H. (1).

Professor Oliver

Courses for Graduates

A cycle of four courses, dealing with French literature of the seventeenth, eighteenth, and nineteenth centuries, will be given in four successive summer sessions.

S122. Seventeenth Century French Drama.—Lectures and interpretations. Reports on assigned topics of investigation. M.T.W.T., 9; 114 L. H. (1 unit). Professor Oliver

Prerequisite: Three years of college French and the consent of the instructor.

SPANISH

S1a. Elementary Course.—Pronunciation, grammar, reading of easy prose. Fuentes-Francois, *A Practical Spanish Grammar*; Wilkins and Luria, *Lecturas Faciles*. T.W.T.F., 8,9; 211 L. H. (4). Mr. Lopez

Equivalent: Spanish 1a, or one year of high-school Spanish.

S2a. Modern Spanish.—Rapid reading; review of grammar; composition. Espinosa, *Advanced Spanish Composition and Conversation*; Carrión y Aza, *Zaragüeta*; Alarcon, *El Capitán Veneno*; *Martínez de la Rosa*; *La Conjuración de Venecia*; Laguardia, *Argentina*. M.T.W.T., 9; 218 L. H. (2). Professor Fitz-Gerald

Note:Students who have had Spanish S2a in a previous summer session with different reading will be admitted to this course for full credit, but must do additional work outside the class.

Prerequisite: One year of college Spanish or the consent of the instructor.

Equivalent: Spanish 2a (in part).

S6a. Spanish Elementary Conversation. T.T., 10; 211 L. H. (1). Mr. Lopez

Prerequisite: One year of college Spanish or the consent of the instructor.

Courses for Graduates

A cycle of four courses, dealing with Spanish drama and prose of the seventeenth and nineteenth centuries, will be given in four successive summer sessions.

S122. Seventeenth Century Spanish Drama (The Comedia of the Golden Age).—Lectures and readings. M.T.W.T., 11; 212 L. H. (1 unit). Professor Fitz-Gerald

Prerequisite: Three years of college Spanish or the consent of the instructor.

SOCIOLOGY

Assistant Professor Sutherland, Mr. Reed

Courses for Undergraduates

S1. The Principles of Sociology and Their Application to Present Problems.—Text: Hayes, E. C., *Introduction to the Study of Sociology*, (Appleton Co.) M.T.W.T.F.S., 8; 308 L. H. (3). Mr. Reed

Prerequisite: Junior standing or equivalent.

Equivalent: Sociology 1.

Courses for Advanced Undergraduates and Graduates)

S9. Criminology.—Nature, causes, and treatment of the criminal; evolution of modern methods of criminal procedure and penology; recent experiments and tendencies. M.T.W.T.F., 8; 306 L. H. (3). Assistant Professor Sutherland

Prerequisite: Sociology 1 or the consent of instructor.

Equivalent: Sociology 9.

S10. Population.—Theories and policies of population; Malthus' Principle and its critics; problems in the population of the United States; immigration, race-mixture, conditions affecting public health, death-rate, birth rate, "race-suicide," marriage, divorce, selective influences at work on the "population type." M.T.W.T.F. 9; 306 L. H. (3).

Assistant Professor Sutherland

Prerequisite: Sociology 1 or the consent of the instructor.

Equivalent: Sociology 10.

Note: Courses S9 and S10 meet five times per week. Sufficient work will be assigned to entitle the student to three hours credit.

SPANISH

(See Romance Languages)

ZOOLOGY

Assistant Professor Van Cleave, Dr. Higgins, and Assistant

Courses for Undergraduates

S1. General Zoology.—Animal biology; principles of structure; function, interrelations, origin, and development of animal life; simpler and best-established generalizations in zoological theory. Recitations and lecture. M.T.W.T.F., 1; 229 N. H. Laboratory; M.T.W.T.F., 10,11; 312 N. H. (5 or 4). If for 4 credit hours only, omit Friday classes.

Assistant Professor Van Cleave, Dr. Higgins, and Assistant

Equivalent: Zoology 1, if for 5 hours credit.

S2. Vertebrate Zoology and Comparative Anatomy.—Classification of the Chordata; early stages of vertebrate embryology; structure of vertebrate tissues; anatomy of systems of organs considered in respect to their functions, ontogeny, and evolution in the vertebrate series; anatomical studies of types of Chordata. Recitations and lectures. M.T.W.T., 1; 330 N. H. Laboratory, M.T.W.T.F.S., 10,11; 310 N. H. (5). Dr. Higgins and Assistant

Prerequisite: Zoology 1.

Equivalent: Zoology 2.

S27. Essentials of Laboratory Technic.—Instructions in collection of zoological materials and their preparation for use, including preserving, sectioning, staining, and mounting. T.T., 9, 10; 310 N. H. Dr. Higgins

Prerequisite: An introductory course in biology.

Course for Advanced Undergraduates and Graduates

S21. Introduction to Zoological Research.—Morphology, development, and taxonomy of invertebrates (exclusive of insects). Laboratory, assigned reading, and conferences. (2 to 5). Hours to be arranged. Assistant Professor Van Cleave

Prerequisite: Senior standing and one year in Zoology.

Course for Graduates

S104. Morphology and Taxonomy of Invertebrates.—Individual problems dealing with the minute anatomy and classification of invertebrates exclusive of insects. (½ to 1 graduate unit). Hours to be arranged. Assistant Professor Van Cleave

LIBRARY TOWER

LEARNING AND LABOR

University of Illinois

SUMMER SESSION, 1921

GENERAL ANNOUNCEMENTS
FACULTY AND COURSES

JUNE 20 TO AUGUST 13, 1921

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UNIVERSITY OF ILLINOIS

Administrative Officers, Summer Session

David Kinley, Ph.D., LL.D., President of the University
Charles Ernest Chadsey, Ph.D., Litt. D., Dean of the College of Education, *Director of the Summer Session, 203 University Hall*
George Phillip Tuttle, B.S., Registrar, 156 Administration Building
Harrison Edward Cunningham, A.B. Secretary of the Board of Trustees
Lloyd Morey, A.B., B.Mus., C.P.A. Comptroller

Calendar

Summer Session, 1921

June 20, Monday—Registration Day
August 12 and 13, Friday and Saturday—Final Examinations

First Semester, 1921-22

September 12 to 16, Monday to Friday—Entrance Examinations
September 19 and 20, Monday and Tuesday—Registration Days
September 21, Wednesday, 8 a. m.—Instruction Begins

Growth and Registration of Students

ALL DEPARTMENTS

1894-'95	810
1890-1900	2225
1904-'05	3734
1909-'10	5118
1914-'15	5956
1915-'16	6427
1916-'17	6828
1917-'18	5590
1918-'19	7157
1919-'20	9249
1920-'21	9493

OFFICERS OF INSTRUCTION

SUMMER SESSION, 1921

Charles Ernest Chadsey, Ph.D., Litt. D., Director

Adams, Roger, Ph. D., *Professor of Chemistry*
Anders, Ida, B.S., *Associate in Home Economics, Iowa State College of Agriculture and Mechanical Arts*
Annell, Esther Willard, A.B., *Assistant in Library Science*
Arie, Janet May, A.B., *Assistant in Library Science*
Baldwin, Edward Chauncey, Ph. D., *Assistant Professor of English Literature*
Barnes, Otis Avery, M.S., *Assistant in Chemistry*
Beal, George Denton, Ph.D. *Associate Professor of Chemistry*
Bearg, Ernest E., A.B. *Assistant Coach*
Belting, Paul Everette, Ph.D., *Assistant Professor of Secondary Education*
Benton, Elbert Jay, Ph.D., *Professor of History, Western Reserve University, Cleveland, Ohio*
Berg, van den, Henri Jacobus, *Instructor in Music*
Bond, Ethel, B.L.S., *Instructor in Library Science*
Boyd, Anne Morris, B.L.S., *Instructor in Library Economics and Assistant in Library*
Bradbury, Charles Earl, B.P., *Assistant Professor of Art and Design*
Braley, Silas Alonzo, Ph.D., *Assistant Professor of Chemistry*
Bredvold, Louis Ignace, A.M., *Instructor in English*
Brown, Pembroke Holcomb, A.M., *Instructor in Economics*
Bullock, David Madison, *Trainer*
Burlison, William Leonidas, Ph.D., *Professor of Crop Production; Head, Department of Agronomy*
Bussell, Nelle E., *Assistant in Physical Education for Women*
Cameron, Edward Herbert, Ph.D., *Professor of Educational Psychology*
Canter, Howard Vernon, Ph.D., *Professor of Classics*
Chadsey, Charles Ernest, Ph.D., Litt. D., *Director of the Summer Session, Dean, College of Education, Professor of Education*
Cheydleur, Frederic D., Docteur de l 'Université, *Professor of Romance Languages, University of Wisconsin*
Cleavinger, John Simeon, B.L.S., *Associate in Library Science*
Coble, Arthur Byron, Ph.D., *Professor of Mathematics*
Coleman, George Hopkins, M.S., *Research Assistant in Chemistry*
Crabb, David Wendell., A.B., *Assistant in Accountancy*
Diffenbaugh, Guy Linton, A.M., *Instructor in English*
Dolch, Edward William, A.M., *Instructor in English*
Englis, Duane Taylor, Ph.D., *Associate in Chemistry*
Ensign, Newton Edward, A.B., B.S., *Associate in Theoretical and Applied Mechanics*
Erb, John Lawrence, F.A.G.O., *Director, School of Music*
Filbey, Edward Joseph, Ph.D., C.P.A., *Assistant Professor of Accountancy*
Folsom, Justus W., D.Sc., *Assistant Professor of Entomology*
Freer, Louise, *Director of Physical Education for Women*
Gill, Harry Lovering., *Associate in Track*
Glasgow, Robert D., Ph.D., *Instructor in Entomology*
Griffith, Coleman R., Ph.D., *Instructor in Psychology*
Griffith, John Lorenzo, A.B., *Assistant Professor of Physical Education*
Ham, Lloyd Blinn, A.M., *Assistant in Physics*
Haumont, Louis Paul, *Assistant in Romance Languages*
Harrah, Ezra Clarence., A.M., *Assistant in Zoology*
Hollister, Horace Adelbert, A.M., *Professor of Education*
Hottes, Charles Frederick, Ph.D., *Professor of Plant Physiology*
Huff, George A., B.S., *Director of Physical Education for Men*
Hurst, John W., B.S., *Assistant in Mathematics*
Johnson, Frank Tatham, *Instructor in Voice*
Kempner, Aubrey John, Ph.D., *Assistant Professor of Mathematics*

Knipp, Charles Tobias, Ph.D., *Professor of Experimental Electricity*
Knowlton, Edgar Colby, Ph.D., *Instructor in English*
Kremers, Harry C., Ph.D., *Associate in Chemistry*
Kruse, Cornelius Francis, A.M., *Instructor in Educational Psychology*
Kudo, Rokusaburo, Ph.D., *Instructor in Zoology*
Lessing, Otto Eduard, Ph.D., *Professor of German*
Lewis, Howard Bishop, Ph.D., *Associate Professor of Physiological Chemistry*
Littleton, Ananias Charles, A.M., C.P.A., *Assistant Dean, College of Commerce, Assistant Professor of Accountancy*
Lundgren, Carl L., B.S., *Baseball Coach*
Lybyer, Albert Howe, Ph.D., *Professor of History*
Marston, Leslie R , A.M., *Professor of Psychology, Greenville College, Greenville, Illinois*
Mays, Arthur B., B.S., *Assistant Professor of Industrial Education*
McFarlan, Lee Horace, A.M., *Assistant in Mathematics*
Monroe, Walter Scott, Ph.D., *Associate Professor of Education and Assistant Director of Bureau of Educational Research*
Nelson, Roy A., M.S., *Assistant in Physics*
Newton, Helen Charlotte, B.S., *Instructor in Home Economics*
Nolan, Aretas Wilbur, M.S., *Associate Professor of Agricultural Education and Director of Teacher Training in Vocational Agriculture*
Oesterling, Henry Carl, A.B., *Assistant in English*
Oliver, Thomas Edward, Ph.D., *Professor of Romance Languages*
Olmstead, Albert Ten Eyck, Ph.D., *Professor of History*
Parr, Rosalie Mary, Ph.D., *Associate in Chemistry*
Paul, Harry G., Ph.D., *Associate Professor of English Language and Literature*
Pettit, Harvey Pierson, A.M., *Assistant in Mathematics*
Phillips, Mary Dodds, *Instructor in Public School Music*
Pieper, John, M.S., *Associate in Crop Production*
Porter, Charley Lyman, B.S., *Assistant in Botany*
Putnam, Willis Sumner, Ph.D., *Assistant Professor of Theoretical and Applied Mechanics*
Ratcliffe, Samuel Caleb, A.M., *Instructor in Sociology*
Reedy, John Henry, Ph.D., *Assistant Professor of Chemistry*
Reid, Dwight Logan, M.S., *Associate in Agricultural Education*
Rutherford, Elizabeth Jane, A.B., *Assistant in Psychology*
Ryan, John P., A.M., *Professor of Speech at Grinnell College, Iowa*
Schlatter, Charles F., B.S , *Instructor in Accountancy*
Schmidt, Clarence Carl, A.B., *Assistant in Physics*
Schuettner, Arthur James, *Director of Men's Gymnasium*
Seybolt, Robert Francis, Ph.D., *Associate Professor of History of Education*
Soto, Rafael Arcangel, A.M., *Assistant in Romance Languages*
Steimley, Leonard Leo, Ph.D., *Instructor in Mathematics*
Story, Russell McCulloch, Ph.D., *Associate Professor of Political Science*
Sutherland, Edwin Hardin, Ph.D., *Assistant Professor of Sociology*
Tanner, Fred Wilbur, Ph.D., *Assistant Professor of Bacteriology*
Taylor, Eva Cloud, *Lecturer in the Library School*
Van Horne, John, Ph.D., *Assistant Professor of Romance Languages*
Vaughn, Samuel Jesse, A.B., *Associate Professor of Industrial Education*
Wahlin, Gustaf Eric, Ph.D., *Assistant in Mathematics*
Watkins, Gordon, Ph.D., *Associate Professor of Economics*
Willard, William A., Ph.D., *Professor of Zoology, University of Nebraska*
Williams, Charles Allyn, Ph.D., *Assistant Professor of German*
Williams, Lewis Ward, A.M., *Instructor in Education, Secretary of the Appointments Committee*
Winters, Frank J., B.P.E., *Associate in Physical Education*
Zuppke, Robert Carl, Ph.B., *Assistant Professor of Physical Education*

GREEN STREET

GENERAL STATEMENT

Location of the University of Illinois

The University of Illinois is situated in Champaign County in the eastern central part of the state between the cities of Urbana and Champaign, and within the corporate limits of the former It is one hundred and twenty-eight miles south of Chicago, on the main Chicago-New Orleans line of the Illinois Central, the station being Champaign. The Wabash and the Cleveland, Cincinnati, Chicago & St. Louis ("Big Four" of the New York Central Lines) railroads have stations in both cities. The cities of Urbana and Champaign have together a population of 29,000.

The institution was incorporated February 28, 1867, under the name of the Illinois Industrial University. It was not until 1885 that the Legislature changed the name to the University of Illinois.

Buildings and Grounds

The land occupied by the University and its several departments embraces about two hundred and thirty-eight acres, besides a farm of about nine hundred ninety acres. The buildings at Urbana are fifty-one in number, chief of which are the Agriculture Building, Agronomy Building, Armory, Astronomical Observatory, Auditorium, Beef Cattle Building, Central Heating Station, Chemistry Laboratory, Physics Laboratory, Electrical Engineering Laboratory, Engineering Hall, Lincoln Hall, Farm Mechanics Building, Horticulture Building, Law Building, Library Building, Laboratory of Applied Mechanics, Mechanical Engineering Laboratory, Men's Gymnasium, Metal Shop, Natural History Building, Pumping Station, University Hall, Woman's Building, Wood Shop, Foundry, Commerce Building, Transportation Building, Gymnasium Annex, Stock Pavilion, Administration Building, Vivarium Building, Ceramics Building, the College of Education Building, and the Smith Memorial Hall.

Libraries

The University library, at Urbana, contains 444,000 volumes, and receives over 3,000 periodicals; the current numbers of many of these periodicals are kept in the public reading room. The library of the State Laboratory of Natural History contains 10,500 volumes and 54,000 pamphlets.

The library is housed, for the most part, in the Library building, and is for the use of the whole University. All students have the direct use of 10,700 volumes in the reading rooms, and in addition graduate and advanced undergraduate students have the use of the seminar libraries. Twenty-one seminar and departmental collections are maintained in various buildon the campus, including the six seminars in Lincoln Hall.

The Summer Session

The Summer Session of the University of Illinois for 1921 will open on June 20 and close on August 13, making a term of *eight weeks* or one-half a semester, except for students taking courses in physical education for men, or athletic coaching and certain elementary courses in Library Science, for whom the term is *six weeks* from June 20. The opening day will be devoted to registration. The final examinations will be held on Friday and Saturday of the last week.

All of the courses, except those in physical education for men, and certain elementary courses in Library Science, will extend through the eight weeks. Students who wish to remain the six weeks only, however, may obtain from the Director of the Summer Session a certificate for such attendance, but university credit will not be given for six-weeks' courses, except for those in physical education for men and in athletic coaching.

The number of semester hours' credit which may be earned in each course is stated in the descriptive outline given later in this announcement. Students may register for courses aggregating eight hours or less.

Purpose

The Summer Session is an organized integral part of the University year. Tho its organization is not subdivided into colleges, numerous courses are offered by departments in the Colleges of Liberal Arts and Sciences, Commerce, Agriculture, Engineering, Education, and in the School of Music and the Library School. All courses may be counted toward either an A.B., B.S. or B.L.S. degree, or toward a master's degree, unless otherwise specified. By attending two Summer Sessions a regular student may secure his degree a half year earlier than he otherwise can.

Students who have just graduated from an accredited high school may matriculate in the Summer Session and obtain credit for a half-semester. Pre-medical students are strongly urged to do this and to register for chemistry or zoology, mathematics, rhetoric, or other prescribed pre-medical subjects.

One of the primary purposes of the Summer Session is to meet the needs of the teachers in the public schools, who wish to spend a part of the summer vacation in serious study or investigation. Numerous courses are designed particularly for high-school teachers, supervising officers, teachers of special subjects (agriculture, art, household science, manual training, music, industrial education, etc.), librarians and coaches of athletic teams; graduate courses are offered for college instructors, school supervisors, and principals who are working for advanced degrees.

Admission

Admission in regular status to courses in the Summer Session for which university credit is granted is limited to students who could be regularly admitted into the colleges of the University (Liberal Arts and Sciences, or Commerce, or Engineering, or Agriculture, or Education, or Library School) in which they would be registered in the winter session.

In order to meet in full the entrance requirements for any one of these undergraduate colleges, a student must be a graduate of an accredited high school (or in lieu of such graduation, must pass entrance examinations in five units, including English composition, 1; algebra, 1; and three others to be designated by the University authorities in each case), and must obtain credit, either by passing entrance examinations or by presenting certificates of work completed in accredited secondary schools or other recognized schools, for 15 units of high-school work, or the equivalent, in subjects accepted for admission to the University, including in the case of each college certain subjects especially prescribed for admission to that college.

Admission to courses which give university credit, as *special students, not candidates for a degree*, may be granted to persons 21 years of age or over, subject to the general regulations of the University relating to special students.

(1) The subjects prescribed for admission to the *College of Liberal Arts and Sciences*, for the *General Curriculum*, the *Curriculum in Journalism*, and the *Pre-Legal Curriculum*, are: English, 3 units; algebra, 1 unit; plane geometry, 1 unit; laboratory science, 1 unit; Latin, Greek, French, German, or Spanish, 2 units (both units in the same language). Seven elective units are required to make up the total of 15 units.

(2) For the *College of Liberal Arts and Sciences*, for the curriculums in *Household Administration* and for *Household-Science Teachers*, the prescriptions are the same as in paragraph 1, except that the laboratory science, 1 unit must be physics. (See also paragraph 7.)

(3) For the *College of Liberal Arts and Sciences*, for the *Pre-Medical Curriculum*, the prescribed subjects are English, 3 units; algebra, 1 unit; plane geometry, 1 unit; laboratory science, 1 unit; Latin, Greek, French, or German, 2 units (both units in the same language); history or civics, 1 unit Six elective units are required to make up the total of 15 units.

(4) For the *College of Liberal Arts and Sciences*, for the curriculums in *Chemistry* and *Chemical Engineering* the prescribed subjects are: English, 3 units; algebra, 1 unit; plane geometry, 1 unit; laboratory science, 2 units, German or French, 2 units (both units in the same language). Six elective units are required to make up the total of 15 units.

(5) For the *College of Engineering*, the prescribed subjects are: English, 3 units; algebra, 1½ units; plane geometry, 1 unit; solid and spherical geometry, ½ unit; laboratory science, 1 unit Eight elective units are required to make up the total of 15 units.

(6) For the *College of Agriculture*, for the *agricultural curriculums*, the prescribed subjects are: English, 3 units; algebra, 1 unit; plane geometry, 1 unit; laboratory science, 2 units. Eight elective units are required to make up the total of 15 units.

(7) For the *College of Agriculture*, for the curriculum in *Household Science*, the prescribed subjects are the same as in paragraph 6 except that one of the units of laboratory science must be physics.

(8) Students who can meet the prescriptions for any of the other colleges as outlined above may be admitted to the *College of Commerce and Business Administration.*

(9) For the *College of Education*, sixty hours of university credit except for the curriculums in *Athletic Coaching and Industrial Education*, in which the prescribed subjects are the same as in paragraph 1 or 2.

(10) Admission to the eight-weeks courses in the *Library School* is conditioned on the completion of four years of college work in the Liberal Arts and Sciences.

A student who transfers from another college or university must present a letter of honorable dismissal, and transcript of record, from the institution previously attended.

Registration

Students will present themselves for registration on Monday, June 20. *The registration offices will be in the Library Building.* A representative of each department offering Summer Session courses will be present throughout the day. Students will consult with these representatives regarding the courses for which they wish to register. The study blanks will then be filled out, submitted to the Director for approval, and filed with the Registrar.

Students who wish to register for advanced degrees will first secure their study-lists at the Registrar's office, 156 Administration Building.

Fees

All fees are due upon registration.

A tuition fee of twelve dollars ($12) is required of all students in regular attendance at the Session. This entitles one to admission to regular courses and to all special lectures. It also entitles one to one lesson per week of music of collegiate grade. An extra laboratory fee is charged in some courses for materials used. Any single course, counting not more than two and one-half credit hours, may be taken for a fee of six dollars ($6) and the laboratory fee, if there be any in connection with the course taken.

In addition to the above general fees students registering in courses in applied music (voice, piano, violin, violoncello, organ, or band instruments) pay special music fees as follows:

For one lesson a week	$ 3.00
For two lessons a week	5.00
Piano for practise one hour a day for the Session	1.50
Additional hours at the same rate.	
Organ for practise one hour a day for the Session	10.00

By a ruling of the Board of Trustees of the University, all high school teachers in Illinois, and all other teachers in the State who are qualified to matriculate in the University as regular students, are entitled to Summer Session scholarships, exempting them from payment of the tuition fee. To matriculate regularly in the University, one must satisfy in full entrance requirements for some one of the colleges as outlined on page 6.

By a more recent resolution of the Board of Trustees, the scholarship privilege is extended to graduates of the Illinois State normal schools, class of 1921, and to persons (otherwise qualified) who have not been teachers the past year but who are under contract to teach in the state during the coming year.

By action of the Board of Trustees, librarians and library assistants in Illinois libraries, and persons under contract to serve in such positions, and who can matriculate in the University, shall be exempt from the payment of the incidental and tuition fees in the Summer Session.

A person who wishes to take advantage of the scholarship privilege should present to the Registrar prior to June 1, 1921, a statement from the board of education employing him, to the effect that he has either been teaching during the past year or is under contract to teach during the coming year. A normal school graduate (class of 1921) must present either a diploma or a written statement from the president of the normal school certifying that he is a graduate of this year's class.

Application blanks for scholarships may be obtained by addressing the Registrar.

A CAMPUS SCENE

The Bachelor's Degree

All the undergraduate work offered in the Summer Session carries regular university credit which may be counted, unless otherwise specified, towards the degree of Bachelor of Arts or Bachelor of Science. By careful selection of courses the graduation requirements of the College of Liberal Arts and Sciences may be met in large part by Summer Session work. In the Colleges of Engineering and Agriculture the non-technical requirements and a part of the technical engineering or agricultural requirements may be covered in the Summer Session. For the detailed requirements of the several colleges the student should consult the Annual Register of the University under the head of the college in which he is interested. *A student who is definitely a candidate for a degree* should also check over the work he has had and plan his future course in consultation with the dean or assistant dean of the college of his choice—

For the College of Liberal Arts and Sciences—Dean Babcock, Room 304, University Hall.
For the College of Commerce and Business Administration—Dean Thompson, Room 104, Commerce Building.
For the College of Engineering—Assistant Dean Jordan, Room 300, Engineering Building.
For the College of Agriculture—Assistant Dean Rankin, Room 100, Agriculture Building.
For the College of Education—Dean Chadsey, Room 203, University Hall.
For the Library School—Director P. L. Windsor, 316 Library Building.

General Assembly

On the first Thursday of the Session, June 23, at 4 p.m., an Assembly will be held in Room 218, University Hall. All students and members of the instructional staff are requested to attend. At this time general announcements will be made concerning lectures, entertainments, etc.

Lectures, Receptions, and Entertainments

In addition to the regular class exercises, the Summer Session provides a number of incidental exercises which give an atmosphere differing but little from that of the other sessions of the year; receptions given to students; entertainments, debates, teachers' conferences, and clubs arranged by the students themselves; games and athletic contests; and the general lectures given by members of the University departments and by men from other institutions.

The song services, which proved so successful during the recent sessions, will be continued, under the direction of Director J. L. Erb of the School of Music. All students and faculty members are cordially invited to take part in the singing on the Auditorium steps Wednesday evenings at 6:45.

Director Erb will give a series of organ recitals during the Session.

Preparation for State Teachers' Certificates

To teachers who desire to make thoro preparation for the state-certificate examinations, the Summer Session offers marked advantages, especially in connection with the professional subjects.

Among the provisions of the certificating law, enacted by the General Assembly in 1913, are the following examination requirements for the various kinds of certificates:

State Certificates

1. Four-year elementary-school certificate: Examination in English, educational psychology, and principles and methods of teaching.
2. Four-year high-school certificate: Examination in English, educational psychology, and principles and methods of teaching.
3. Four-year supervisory certificate: Requirements are the same as for the elementary-school certificate, except that the examination includes, in addition, sociology, history of education, and school organization, administration, and supervision.

County Certificates

1. Third-grade elementary-school certificate: Examination in common branches.
2. Second-grade elementary-school certificate: Examination in common branches, pedagogy, elementary science.
3. First-grade elementary-school certificate: Examination in the common branches, three of the natural sciences; English, algebra, general history, and pedagogy.
4. High-school certificate: Examination in English, pedagogy, and six high-school subjects.
5. Supervisory certificate: Examination in English, educational psychology, history of education, and school administration.
6. Special certificate: Examination in English and principles and methods of teaching.

Examinations for the *State Elementary-school Certificate*, the *State Supervisory Certificate*, and the *State High-School Certificate* will be held at the University in July, *provided that at least fifteen applicants notify the State Superintendent prior to June 10, 1921, of their wish to take the examination here.*

The following excerpt from Circular No. 72 of the office of the State Superintendent of Public Instruction describes the new method of preparing theses:

"A thesis prepared under the direction of a teacher in a normal school, college or university either in residence or by correspondence, and accompanied by a statement from such teacher as to the method and spirit of study, the originality and thoroughness shown by the candidate in such preparation and an estimate of the thesis, will be accepted. Candidates who cannot prepare a thesis under these conditions will be given three hours at the examination to write upon the subject selected."

The instructors at the University will be glad to direct the preparation of theses to be submitted to meet the above requirements.

The following Summer Session courses are especially adapted to prepare for the professional examinations:

Education S10: Technic of Teaching.

Education S23, S27, and S60 will be valuable for those preparing theses for the State Supervisory Certificate.

Education S11: Ancient and Medieval Education. (The applicant for the State Supervisory Certificate must pass an examination in the history of education.)

Education S25: Educational Psychology.

Education S6: The Principles of High-School Education.

Attention is also called to the various courses in English and rhetoric in connection with the English requirements for all certificates.

Graduate Work in the Summer Session

In recent summer sessions the University has placed increasing emphasis on graduate courses leading to the master's degree. The departments which are closely related to high-school teaching and to educational administration have been selected as the centers of this emphasis. An attempt is made to vary the graduate offerings from year to year so that advanced students who attend the University summer after summer may continue to find acceptable work in their chosen fields.

Graduate students in the Summer Session are subject to the same scholastic requirements as those in the regular University year. *Their study lists must be approved by the Dean of the Graduate School, or his representative*, in 109 Commerce Building. Attendance on four summer sessions, or one semester and two summer sessions, is considered the equivalent of one year in residence. If in these sessions the required amount of work is properly done a master's degree may be earned in this way.

No course offered in the Summer Session may be taken for credit towards a higher degree unless it is specially described in the Summer Session circular as accepted for that purpose.

In certain cases it is possible for a graduate student to complete the thesis requirements for the master's degree to the extent of the last fourth of the total requirement for the degree under a leave of absence. This privilege may be granted in the event that the student is able

to take advantage of opportunities for research and investigation that are not afforded in the University community. Superintendents, principals, and class-room teachers frequently find it possible to carry on investigation in connection with their school work. There are, for example, numerous problems of school administration and of teaching for which the public school itself forms the only available "laboratory." Where the investigation of such problems is prosecuted under the direction of a university department, it may be possible, on individual petition beforehand, to count the work toward the master's degree.

Students working for their masters' degrees in the Summer Session must announce their thesis subjects not later than the beginning of their third session in residence.

Graduate courses in medical sciences are offered in the summer quarter between June and September at the College of Medicine of the University of Illinois in Chicago. Circulars describing the courses offered and conditions of admission and work may be obtained from the Secretary of the University of Illinois College of Medicine, Congress and Honore Streets, Chicago.

For further information about advanced degrees and the regulations therefor, the Graduate School circular should be consulted.

Vocational and Industrial Education Courses

Courses will be offered in vocational and industrial education in preparation for teaching agriculture, home economics and the industries under the terms of the Smith-Hughes Act. For such courses in the training of teachers of agriculture, see page 18, in home economics, see page 32 in the industries, see page 32.

"Through the enactment of the Smith-Hughes Act, State Boards for Vocational Education n each of the states accepting the provisions face the comparatively new problem of training teachers for service in the Vocational Schools or Departments of Trade and Industrial Education which have been established, or may be established in accordance with the standards of the Federal law." (Carris Memo. Federal Board for Vocational Education.) The University of Illinois, College of Education, has been appointed by the Illinois State Board of Vocational Education as an institution to give such training for the State of Illinois.

The following courses will be given in the Department of Industrial Education: Survey of Industrial Education; Teaching Related Technical Subjects; Teaching General Continuation Subjects; Teaching Shop Work; Woodwork; Methods of Teaching Woodwork; Organization and Administration of the Part-time School, and Content and Methods of the Industrial Arts.

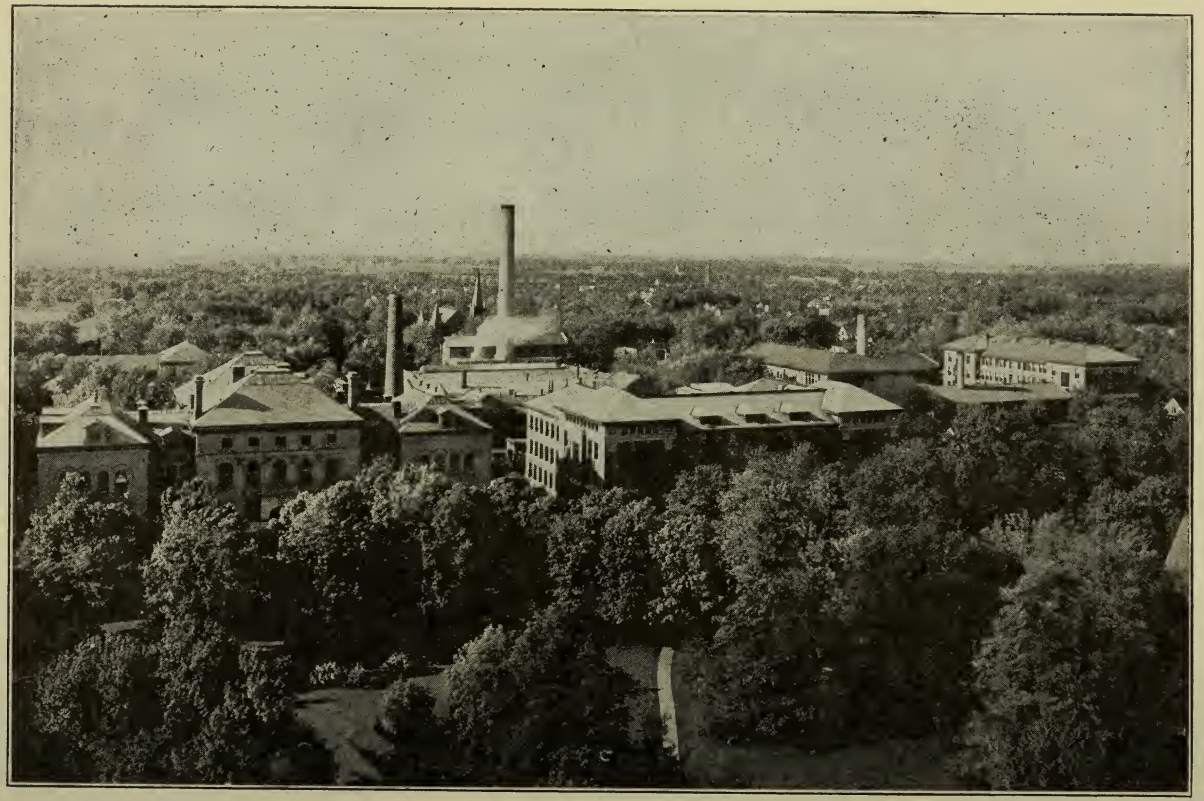
The prerequisites for industrial courses in the Summer Session and the complete description of the courses are stated on page 32.

Courses in Library Science

Beginning Tuesday, June 21, 1921 and continuing for six weeks, courses will be conducted to which will be admitted (1) high-school graduates actually employed as librarians, or library assistants, or as teacher-librarians, or under definite appointments to serve in such positions, and (2) approved students, whether librarians or not, who have completed one year of study in a college or normal school. The curriculum will meet especially the needs of workers in college, public, and high-school libraries of Illinois, and no tuition fee will be charged students entering from a library in this state; students entering from libraries in other states will pay a tuition fee of $12. The work is under the general direction of the faculty of the Library School, and the instruction will be given by members of the faculty, supplemented by lectures by neighboring librarians. No credit toward the B.L.S. degree is given for the work.

In addition, courses of the regular two-year curriculum are offered to college graduates who can satisfy the entrance requirements. These courses are accepted for credit to the B.L.S. degree. Admission to these courses is conditioned on the presentation of credentials showing that the applicant holds a Bachelor's degree in Arts or Sciences from the University of Illinois or has had other equivalent training.

Application blanks for admission must be secured, and these should be filled out and sent to the Director of the School together with such additional statements as the candidate may offer, showing his qualifications for admission. The application must be filed sufficiently early to enable the School to receive replies from librarians and others who have personal knowledge of the applicant.



BIRDSEYE VIEW

For further information than that contained in the description of courses, (pages 33, and 34,), address the Director of the University of Illinois Library School, Urbana, Illinois

Teachers' Conferences

The informal features of the Session will include a continuation of the Conference of Teachers, Superintendents, and Principals. The importance of these round-table discussions, supplementing the more formal class exercises, has been amply demonstrated by the experience in other sessions. Members of the staff of the College of Education will organize and conduct these conferences.

Teachers' conferences have also been arranged for by the Departments of Agricultural Education, Education, English, Industrial Education, Mathematics, Physics, and Romance Languages.

Courses for Athletic Coaches

Courses for Athletic Coaches were established in connection with the Summer Session of 1914, under the general direction of George A. Huff, Director of Physical Education for men, to meet the growing demand, not only from high schools, but from colleges and other institutions as well, for trained men to direct and coach athletics. They were designed to assist, both the high-school teacher or principal who desired to become proficient in coaching one or more athletic teams and the man who intended to take up the directing of athletics or coaching as a vocation.

The courses will again be a feature of the Summer Session, occupying the first six weeks. All the courses will be taught by the men who coach the athletic teams of the University of Illinois: in baseball (Director Huff and Mr. Carl Lundgren), track athletics (Mr. Harry Gill), basketball (Mr. Frank J. Winters), gymnastics (Mr. Arthur J. Schuettner,) football (Mr. Robert Zuppke), and group games and mass athletics (Mr. J. L. Griffith.) The athletic plant of the University is turned into a laboratory and a larger part of the instruction is given on Illinois Field.

Students may devote either their whole time, or part of their time to these courses. Detailed information regarding the courses for Athletic Coaches may be found in a special circular which will be sent on application to George A. Huff, Director, Gymnasium, Urbana, Illinois.

Athletics

Altho both the men's and women's gymnasiums will be used in some parts of the regular class work in Physical Education, they are nevertheless open to students not registered in those courses, for the purpose of general recreation and exercise. Both of the gymnasiums contain swimming pools, shower baths and other forms of bath, lockers, and dressing rooms. Students are charged a small sum for a locker. The tennis courts, general athletic fields, and golf course on the University campus are open to the student body.

Board and Lodging

The fact that the larger part of the usual University community will be away at the time of the Summer Session will make lodgings and boarding accomodations plentiful. The Young Men's and Young Women's Christian Associations of the University will prepare a list of boarding places which can be recommended, and they will aid students in securing desirable locations.

Board may be obtained at from $6.50 to $7.50 a week.

Double rooms near the University, if occupied by two persons, may be had at from $8.00 to $12.00 a month.

Information

For further information on any matter connected with the Summer Session, address the Registrar of the University, or

CHARLES ERNEST CHADSEY,
Director of the Summer Session,
203 University Hall,
Urbana, Illinois.

DESCRIPTION OF COURSES

Explanation

The arrangement of subjects in the following description of courses is alphabetical. The connections of allied departments are indicated by cross references.

"S" (summer) which is prefixed to each of the courses offered is the sign used to distinguish the Summer Session courses from those having the same number offered during the regular University year. Following the description of each course will be found a statement of requirements for admssion to that particular course and a statement of the equivalency of credit for such course as related to the course given in other sessions of the University. For example, the prerequisite for Mathematics 9 is Mathematics 7. This means that Mathematics 7 must be completed before Mathematics 9 may be taken. Since the Summer Session courses do not invariably cover the same ground as courses similarly numbered in the regular sessions of the University, the equivalency is sometimes noted as partial rather than full.

If a course not required for graduation is selected by fewer than five students, it may be withdrawn.

Graduate courses are numbered upwards from 100. Such courses are open only to graduate students.

Credit is reckoned for the undergraduate students in *semester hours* or simply *hours*. An *hour* represents one classroom period a week for one semester, or the equivalent in laboratory, shop, or drawing room. The number of hours for which each course counts is shown after each course by the figure in parenthesis, for example, Education S25. (2½)

The following abbreviations are used to designate the different buildings used during the Summer Session.

Adm.	Administration Building
Agr.	College of Agriculture
Chem.	Chemistry Laboratory
Com.	Commerce Building
E. H.	Engineering Hall
Gen.	Genetics Building
App. Mech.	Laboratory of Applied Mechanics
Law.	Law Building
L. H.	Lincoln Hall
Physics.	Physics Laboratory
N. H.	Natural History Building
S. M. H.	Smith Memorial Hall
T. B.	Transportation Building
U. H.	University Building
Viv.	Vivarium Building
W. B.	Woman's Building
W. S.	Wood Shop

AGRICULTURE AND AGRICULTURAL EDUCATION

Associate Professor NOLAN, Professor BURLISON, Mr. REID, Mr. PIEPER

(All courses in agricultural education are designed for teacher training in vocational agriculture, meeting the provisions of the Smith-Hughes Act for Vocational Education.)

S1. General Agriculture.—Short unit topics in technical agriculture. General survey course, treating the major phases of Agronomy, Animal Husbandry, Horticulture and Farm Management by type studies. (Especially valuable for those who are not registered in the College of Agriculture.) M.T.W.T.F., 8; 122 Agr. (2½). Mr. REID

S50D. Project Supervision.—The projects to be made the basis for visitation and conference in this course are those actually being carried on by students of vocational agriculture in the Champaign and Urbana High Schools: Sec. 1—Field Crop Projects; Sec. 2.—Animal Husbandry Projects; Sec. 3.—Horticulture Projects. Conference hour Th. 2; 552 Agr. Project visitation hours to be arranged. Required of vocational teachers. (2). Mr. REID

S51. Teachers' Course in Agriculture.—Principles and methods in teaching vocational agriculture; consideration of the problems of elementary and secondary school agriculture. M.T.W.T.F., 10; 553 Agr. (2½). Required of vocational teachers. Associate Professor NOLAN

Prerequisite: Education 10 or 25.

S90. Rural Education.—A course designed for rural leaders. Study of rural life conditions, needs, standards, and agencies for improvement. The place and development of agricultural education in rural progress. M.W.F., 11; 553 Agr. (2). Associate Professor NOLAN

Courses for Advanced Undergraduates and Graduates

S91. Agricultural Education.—A course dealing with the major problems of agricultural education. Administration, supervision and teaching in vocational agriculture. Special research work to meet the needs of students' interests. Hours to be arranged. 551 Agr. (3-5). Associate Professor NOLAN

Prerequisite: Agricultural Education 50, 51, and senior standing.

Note: This course not open for enrolment until the fifth week of the Summer Session, preceding the State Conference of Vocational Teachers. Students may enroll then for one month of special intensive study for credit.

S8. Agronomy—Special Farm Crops.—Study of special farm crop problems, adapted to students' needs and interests. Hours to be arranged. 600 Agr. (2-5).

Prerequisite: Agronomy 25 and 7. Professor BURLISON, Mr. PIEPER

Note: This course not open for enrolment until the fifth week of the Summer Session, preceding the State Conference of Vocational Teachers. Students may enroll then for one month of special intensive study for credit.

State Conference of Teachers of Vocational Agriculture.—During the last week of the Summer Session and probably the week following, a State Conference of teachers of vocational agriculture will be held at the University. This Conference will be directed by Mr. CARL COLVIN, State Supervisor of Agricultural Education. Special courses and conferences will be provided by the Department of Agricultural Education for this group, and the two courses announced above, S91 and S8, will be offered for credit for those who need the work to qualify as teachers of vocational agriculture in Illinois.

ART AND DESIGN

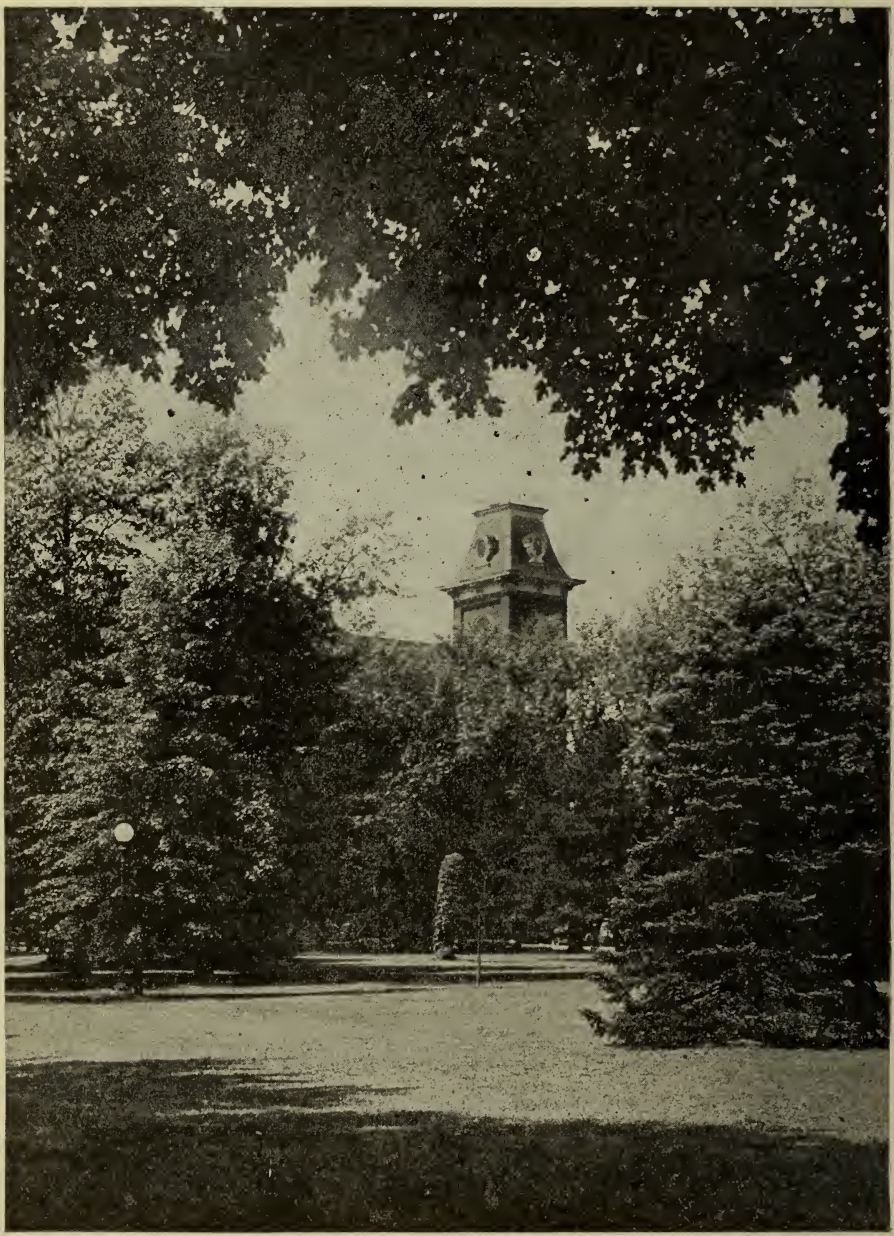
Assistant Professor BRADBURY

S1. Elementary Art.—Principles of construction and perspective. Free-hand drawing in line and tone from still-life, cast, and nature. M.W.F., 1,2; 405 U.H. (2)

Assistant Professor BRADBURY

S3. Drawing from Life.—Study from costumed model with adaptation to illustration and decoration. Art anatomy. M.W.F., 10, 11; 402 U.H. (2). Assistant Professor BRADBURY

S6. Painting.—Color study of portrait and figure in interior and out of doors. Lansdcape. M.W.F., 9,10,11; 402 U.H. (2). Assistant Professor BRADBURY



UNIVERSITY HALL

BACTERIOLOGY

Assistant Professor TANNER

Courses for Undergraduates

S5a. Introductory Bacteriology.—Lectures, assigned readings, demonstrations, and recitations on bacteria, yeasts, and molds; structure, morphology, and systematic relationships; their significance in general sanitation, agriculture, home economics, communicable diseases, etc. (For those who wish an insight into matters of everyday importance such as sterilization, disinfection, food poisoning, etc.). Designed to accompany Bacteriology S5b but may be elected without it. M.T.W.T.F., 8; 100 Chem. (2½). Assistant Professor TANNER

Prerequisite: Sophomore standing; one semester of chemistry, or consent of the instructor.

S5b. Laboratory, Introductory Bacteriology.—Bacteriological technic; study of morphology and physiology of bacteria and certain related micro-organisms; preparation of media and apparatus; staining; cultivation, etc. Designed to accompany Bacteriology S5a. M.W.F. 9-12; 367 Chem. (2½). Laboratory fee $7.00. Assistant Professor TANNER

Prerequisite: Bacteriology S5a or concurrent registration in it; Chemistry 2a, 3a, or 4.

Equivalent: Bacteriology S5a and S5b together are equivalent to Bacteriology 5.

Courses for Undergraduates or Graduates

S7 or S107.—Research for advanced undergraduates (S7) and graduates (S107) in bacteriology. Hours and credit are to be arranged before registration.

BOTANY

Professor HOTTES, Mr. PORTER

Courses for Undergraduates

S1. General Botany.—Structure, physiology, natural history, and uses of plants. Intended as a foundation for advanced study in any branch of botany, as well as giving the general knowledge of plant life which every educated person should possess. Lecture T.W.T., 9; 216 N.H. Laboratory T.W.T., 1,2,3; 216 N.H. Quiz Th. 4, 216 N.H. (4) Mr. PORTER

Equivalent: 4 hours of Botany 1.

S27a. Plant Physiology.—Absorption of materials and their transformation within the organism; production and use of food. Lecture-quiz M.W.F., 10. Laboratory M.W.F., 8-10, 11; 308 N.H. (4). Professor HOTTES

Prerequisite: Botany 1 or its equivalent.

Equivalent: 4 hours of Botany 27a.

Courses for Advanced Undergraduates and Graduates

S9b. Plant Physiology.—Physiological problems for those specializing in plant physiology or in its applications to plant breeding, crop production, or plant pathology. Arrange time. 104 Botany Annex. (2-4). Professor HOTTES

Prerequisite: 10 hours of botany, including Botany 27a or 27b or the equivalent; junior standing.

Equivalent: Botany 9b (in part).

Course for Graduates

S102. Plant Physiology.—Research: reports and discussions of results and of current literature. Arrange time; 104 Botany Annex. (½-1 unit). Professor HOTTES

BUSINESS ORGANIZATION AND OPERATION

(See also ECONOMICS and TRANSPORTATION)

Assistant Professor FILBEY, Assistant Professor LITTLETON, Mr. SCHLATTER, and Mr. CRABB

A. ACCOUNTANCY

Courses for Undergraduates

S1b. Principles of Accounting.—Principles of accounting and their application in the art of bookkeeping. Accounting procedure in double entry, illustrating the use of fundamental accounts and books. Text: *Twentieth Century Bookkeeping and Accounting*, Part III with outfit. Quiz M.W.F., 8; Practise T.T., 8, 9; 303 Com. (3). Mr. CRABB

Prerequisite: Accountancy 1a or one unit entrance credit in bookkeeping.

Equivalent: Accountancy 1b.

S2a-S2b. Advanced Accounting.—Fundamentals of cost accounting, theory of partnership and corporation accounts, depreciation, goodwill, reserves and sinking funds; special financial statements, reading balance sheets, illustrative problems. Texts: Rowe's *Cost Accounting*; Klein's *Elements of Accounting*. Lectures and problems. M.T.W.T.F.S., 8, 9; 312 Com. (6). Assistant Professor FILBEY

Prerequisite: Accountancy 1a-1b; Economics 26 and 22; credit in Economics 1.

Equivalent: Accountancy 2a-2b.

S15. Teachers' Course in Bookkeeping.—Methods of approach in teaching; conduct of laboratory work; explanation of difficult transactions; logical development and treatment of columnar books, notes and drafts, interest, discount, controlling accounts, specialized books and records, inventories and financial statements. Lectures on different systems in use. General philosophy of accounts. No specific textbook assigned, but several will be used to illustrate methods. M.T.W.T., 10; 206 Com. (2). Assistant Professor LITTLETON

Prerequisite:—A course in double entry bookkeeping.

B. BUSINESS ORGANIZATION AND OPERATION

Courses for Undergraduates

S1. Business Organization and Operation:—Individual proprietorship, partnership, and corporation; organization for operation; functions and relations of various departments; problems of management. Text: Gerstenberg's *Principles of Business*. M.T.W.T.F.S., 10; 111 Com. (3). Mr. SCHLATTER

Prerequisite: One year of accountancy, Economics 1 or 2.

Equivalent: Business Organization and Operation.

C. BUSINESS LAW

S2. Commercial Law.—Contracts; agency; sales; negotiable instruments; cases; readings and lectures. Text: Huffcut's *Elements of Business Law*. (Not accepted for credit for students in the College of Commerce and Business Administration.) M.T.W.T., 11; 206 Com. (2). Mr. SCHLATTER

CHEMISTRY

Professor ADAMS, Associate Professor LEWIS, Associate Professor BEAL, (in charge), Assistant Professor REEDY, Assistant Professor BRALEY, Dr. ENGLIS, Dr. R. M. PARR, Dr. KREMERS, Mr. COLEMAN, Mr. BARNES, Miss SPARKS

NOTE: All of the courses in chemistry in the Summer Session are equivalent to the courses of the same numbers during the academic year.

Courses for Undergraduates

S1. Elementary Chemistry.—The non-metallic elements. Texts: Noyes' *Textbook of Chemistry;* Noyes and Hopkins' *Laboratory Exercises*, puplished by Henry Holt and Company. Lecture-quiz, M.T.W.T.F.S., 11; 100 Chem. Laboratory, M.T.W.T.F.S., 8,9 or 9,10; (5). DR. ENGLIS, Dr. R. M. PARR, Dr. KREMERS

S1a. Inorganic Chemistry.—For students who have had one year of high-school chemistry. This course may be taken at the same hours as Chemistry S1, but only four hours of laboratory work are required. 100 Chem. (3). Dr. Englis, Dr. R. M. Parr, Dr. Kremers

S1b. Inorganic Chemistry.—For engineering students. This course may be taken at the same hours as Chemistry S1, but only six hours of laboratory work are required. 100 Chem. (4). Dr. Englis, Dr. Kremers

S2a. Inorganic Chemistry and Qualitative Analysis.—Chemistry and qualitative analysis of the more common metals and inorganic compounds. Texts: Noyes' *Textbook of Chemistry;* Noyes and Smith's *Qualitative Analysis*, published by Henry Holt and Company. Lectures, M.T.W.T., 9; 100 Chem. Quiz, M.T.W.T., 8. Laboratory M.T.W.T.F.S., 10,11; (5). Assistant Professor Reedy, Dr. R. M. Parr

Prerequisite: Chemistry 1 or 1a.

S3a. Inorganic Chemistry and Qualitative Analysis.—For students in chemistry and chemical engineering. Texts: Noyes' *Textbook of Chemistry;* Noyes and Smith's *Qualitative Analysis*. Arrange; 100 Chem. (5). Assistant Professor Reedy, Dr. R. M. Parr

S5a. Elementary Quantitative Analysis.—Gravimetric and volumetric methods; stoichiometrical relations, the fundamental laws of chemistry and their application to quantitative analysis. Text: Talbot's *Quantitative Chemical Analysis*. Lecture or quiz, M.T.W.T., 8; 111 Chem. Laboratory, M.T.W.T., 9-12; F., 8-12; 260 Chem. (5). Associate Professor Beal, Assistant Professor Braley

S5b. Quantitative Analysis.—(Continuation of Chemistry 5a). Analysis of silicates, metallic compounds, and alloys; advanced qualitative analysis. Lectures; recitations; laboratory. Treadwell-Hall's *Analytical Chemistry*, Vol. I, II. Lecture or quiz, M.T.W.T., 8; 204 Chem. laboratory, 9-12, (8-12 Fri.); 218 Chem. (5) (Will not be offered for fewer than five students.) Associate Professor Beal, Assistant Professor Braley

Prerequisite: Chemistry 5a or 13a.

S13a. Agricultural Analysis.—Gravimetric and volumetric analysis; analysis of fertilizers and milk. Parallel with Chemistry 5a. Talbot's *Quantitative Chemical Analysis*. (For students in agriculture and household science). Lecture or quiz, M.T.W.T., 8; 111 Chem. Laboratory, M.T.W.T., 9-12; F. 8-12; 260 Chem. (5). Associate Professor Beal, Assistant Professor Braley

Prerequisite: Chemistry 2a or 3a.

Courses for Undergraduates or Graduates

By suitable selection of courses through four consecutive summers it will be possible for persons attending the Summer Session to meet the requirements for the Master's degree, with the exception of the completion of a course in physical chemistry. It is hoped that such a course may be given in subsequent years.

S14a. Elementary Organic Chemistry.—This course should be accompanied by laboratory work, S14c. M.T.W.T.F.S., 8; 217 Chem. (3) Professor Adams

Prerequisite: Chemistry S2a or S3a or equivalent course.

S14b. Organic Chemistry. (second course).—Continuation of Chemistry S14a, with emphasis on special chapters. Library assignments. Not given unless elected by more than three students. M.T.W.T.F.S., 8; 217 Chem. (3). Mr. Coleman

Prerequisite: Chemistry S14a and S14c or equivalent.

S14c. Organic Chemistry. (elementary laboratory).—Typical laboratory methods; syntheses of some of the more important organic compounds. Four times a week, 9-12; 250 Chem. (2). Professor Adams

Prerequisite: Registration in Chemistry S14a or completion of a course equivalent to S14a.

S14d. Organic Chemistry (advanced laboratory).—Synthetical preparations in organic chemistry, and quantitative organic analysis. Four times a week, 9-12; 250 Chem. (2).
Mr. Coleman

Prerequisite: Registration in Chemistry S14b or completion of a course equivalent to S14b.

S15. Physiological Chemistry.—Enzymes; carbohydrates; salivary digestion; gastric digestion; fats; pancreatic digestion; intestinal digestion, bile; putrefaction products; feces; blood; milk; epithelial and connective tissues; muscular tissue; nervous tissue; urine. Qualitative and quantitative work on gastric juice, blood, urine, and milk; the clinical aspect of these topics treated thoroly for the prospective student of medicine. Lectures, demonstrations, conferences; practical work, assigned reading. M.T.W.T.F., 8-12; 463 Chem. (5).
Associate Professor Lewis

Prerequisite: Chemistry 5a or 13a, and 14a-b or 9 and 9c, or equivalent.

S17. Teachers' Course.—Methods of teaching elementary chemistry. T.T.,10; 201 Chem. (1)
Dr. R. M. Parr

Prerequisite: 13 hours of chemistry and senior or graduate standing.

S21. Qualitative Organic Analysis.—Systematic methods for the identification of pure organic compounds and mixtures. 250 Chem. (3). Four laboratory periods to be arranged in mornings.
Mr. Coleman

Prerequisite: Chemistry S14b and S14d or equivalent.

S25. (formerly S5c.) Food Analysis.—Quantitative organic analysis; examination of food and drug products; alcohols, carbohydrates, fats and oils, animal and vegetable foods, nitrogenous bodies, preservatives and colors. Sherman's *Organic Analysis* and Sherman's *Food Products*. Lecture, M.T.W.T.F., 11; 204 Chem. Laboratory, M.T.W.T.F., 8-11; 218 Chem.
Associate Professor Beal

S27. Qualitative Analysis of the Rarer Elements.—The rarer elements and their compounds, identification and separation of the elements; formation, solubilities, and chemical reactions of their salts. Lectures, laboratory, Lecture, W., 9; 303 Chem. Laboratory, arrange. (3).
Dr. R. M. Parr

S92. Chemical Literature and Reference Work.—Periods, leaders, journals; use of literature. Lectures, reports, reference work. Two periods a week; arrange. (1). Miss Sparks

Courses for Graduates

S103a. Advanced Analytical Chemistry.—Four to five times per week. (½ unit, 1¼ with laboratory).
Associate Professor Beal

S104e. Advanced Organic Chemistry.—Chiefly laboratory work. The study and development of methods which are suitable for large scale production. (Limited to ten students in 1921). Laboratory fee, $10.00. (1 unit).
Professor Adams

S105a. Advanced Physiological Chemistry.—The more difficult biochemical preparations; the use of analytical methods. Lecture and laboratory. Laboratory fee, $2.00 an hour. One to five times a week. (½ unit).
Associate Professor Lewis

S11 and S111. Research.—Advanced work for undergraduates (S11) and research work for graduates (S111), in inorganic, organic, analytical, physical, or physiological chemistry. Arrange hours and credit before registration.

Inorganic Chemistry	Dr. Kremers
Analytical Chemistry	Associate Professor Beal, Assistant Professor Braley
Physiological Chemistry	Associate Professor Lewis
Organic Chemistry	Professor Adams
Physical Chemistry	Assistant Professor Reedy

THE CLASSICS

Latin

Professor CANTER

S1. Terence.—Two or more plays will be read with a brief discussion of the language and verse of comedy. M.W.F., 3; 120 L.H. (1½). Professor CANTER

Prerequisite: Three years of high-school Latin.

S2. Roman Private Life.—The family, the house, the organization of society, marriage, dress, education, amusements. T.T., 3; 120 L.H. (1). Professor CANTER

S3. Teachers' Course.—Special attention to problems and methods of instruction in Latin in the secondary school; considerable time will be devoted to the work of the first, second, and third years; the position of Latin in the curriculum of the high schools; the purpose and results of Latin instruction. M.W.F., 4; 120 L.H. (1½). Professor CANTER

For Advanced Undergraduates and Graduates

S102. Roman Oratory.—Its history and development. Twice a week; two credit hours or ½ unit. T.T., 4; 120 L.H. Professor CANTER

Prerequisite: Fifteen hours of college Latin.

DRAWING, GENERAL ENGINEERING

S1. Elements of Drafting.—Engineering lettering; orthographic projection; isometric oblique and perspective drawing; machine sketching; working drawings. Lettering; engineering styles and the making of name plates and titles. Mechanical drawing; drawings from specifications and models with tracings. Dimensioned sketches from parts of standard machines; complete working drawings. Blue-print and VanDykes from tracings. Time sketches of equipment. Text: Miller's *Mechanical Drafting*. 8-11 daily; 303 T.B. (4). Fee $1.50.

S2. Descriptive Geometry.—Theory of orthographic projection; the point, line, and plane; the properties of surfaces; tangents; intersections, and developments. Practical problems; recitations and drawing room work. Text: Miller's *Descriptive Geometry*. 7-10 daily; 303 T.B. (4). Fee $1.50.

Prerequisite: Plane and solid geometry.

ECONOMICS

(See also BUSINESS ORGANIZATION AND OPERATION, AND TRANSPORTATION)

Associate Professor WATKINS, Assistant Professor LITTLETON, Mr. BROWN, Mr. CRABB

Courses for Undergraduates

S2. Principles of Economics.—Text: Seager's *Principles of Economics*, second edition. M.T.W.T.F.S., Section A, 9; Section B, 10, Section C, 11; 101 Com. (3).
Assistant Professor LITTLETON, Mr. BROWN, Mr. CRABB

Prerequisite: One year of university work or (for teachers) the permission of the instructor.

Equivalent: Economics 2.

S3. Money and Banking.—Principles of money; monetary system of the United States; money and prices; development and principles of credit and banking; principles of domestic and foreign exchange; banking system of the United States compared with other banking systems. Text: Holdsworth's *Money and Banking*. M.T.W.T.F., 9; 111 Com. (2½).
Mr. BROWN

Prerequisite: Five hour course in the principles of economics or permission of the instructor.

Equivalent: Economics 3 when used as a prerequisite.

Course for Advanced Undergraduates and Graduates

S12c. Labor Problems.—Genesis and development of industrial relations; analysis of the labor problem; proposed solutions; critical analysis of the position and standpoint of the worker, the employer, and the community. Text: Groat's *Organized Labor in America.* M.T.W.T. F.S., 9; 101 Com. (3). Associate Professor Watkins

Prerequisite: Economics 1 or 2 and senior standing.

Equivalent: Economics 12a.

EDUCATION

Dean Chadsey, Professor Cameron, Associate Professor Monroe, Associate Professor Seybolt, Assistant Professor Belting, Mr. Williams, Mr. Kruse

Courses for Undergraduates

S5. Comparative Education.—(Historical). M.T.W.T.F., 8; 113 L.H. (2½). Associate Professor Seybolt

Prerequisite: Junior standing.

S10. Technic of Teaching.—Discipline and classroom management; characteristics of pupils, individual differences, motive, types of learning—motor control, reflective thinking, and appreciation; types of instruction—drill, problem solving, and the project; lesson for appreciation; supervised study; function and structure of subject-matter, measuring the results of the teaching process. M.T.W.T.F., Sec. I, 1; Sec. II, 2; 208 U.H. (2½). Mr. Williams

Prerequisite: Education 1 or 25.

Equivalent: Education 10 (in part). Education 10 is required of all students who secure the official recommendation of the Appointments Committee for teaching positions in secondary schools.

S25. Educational Psychology.—(Introductory course). Instinct; habit, and the acquisition of skill; perception and memory; conception, judgment, and reasoning; applications to school subjects; lectures, readings, demonstrations. M.T.W.T.F., Sec. A, 9; Sec. B, 10; Sec. C,11; 417 U.H., (2½). Professor Cameron, Mr. Kruse

Prerequisite: Junior standing or experience in teaching.

Equivalent: Education 25 (in part)

Courses for Advanced Undergraduates and Graduates

S4a. Special Problems in Educational Administration.—A consideration, from the standpoint of the superintendent, of problems relating to the administration of city school systems. This course does not duplicate the work offered as S4 in the Summer Session of 1920. T.W.T., 3; 202 L.H. (1½). Dean Chadsey

Prerequisite: Senior standing, or experience as a principal or superintendent.

Equivalent: Education 4 (in part).

S6. Principles of Secondary Education.—The organization and administration of the high school; its purposes and functions in society; a consideration of special problems centering around secondary education. M.T.W.T.F., 11; 208 U.H. (2½). Professor Hollister

Prerequisite: Education 25, or experience in teaching.

Equivalent: Education 6 (in part).

S11. History of Ancient and Medieval Education.—M.T.W.T.F., 9; 207 U.H. (2½). Associate Professor Seybolt

Prerequisite: Senior standing, or experience in teaching.

S22. High-School Educational Measurement.—The administration and interpretation of educational tests with especial reference to high-school problems. M.T.W.T., 9; 211 U.H. (2). Associate Professor Monroe

Prerequisite: Education 25, or the consent of the instructor.

S23. Educational Statistics.—The practical application of statistical method to educational investigation. Methods of gathering data, calculations of statistical measures, and interpretations. M.T.W.T., 10; 311 U.H. (2). Associate Professor Monroe

Prerequisite: Education 25 or its equivalent.

S27. Principles and Construction of High-School Curriculums.—The nature of the curriculum; formal discipline and the curriculum; comparative educational values; educational aims, purposes and objectives; criteria for curriculum construction; analysis of programs of study; building of typical curriculums. M.T.W.T.F., 9; 314 U.H. (2½). Assistant Professor Belting

Prerequisite: Education 25.

Equivalent: Education 27 (in part).

S43. Mental Tests.—Laboratory drill in the technic of mental tests, including tests of sensory capacities; attention, memory; learning; suggestibility; inventiveness; systems of tests for diagnosis of mental age; general intellectual status; mental retardation. M.T.W.T., 10-12; 417 U.H. (2). Professor Cameron

Prerequisite: Education 25 or equivalent, and the consent of the instructor.

S60. High-School Administration.—The state and its relation to secondary education; administrative organization of state and local board of control; certification of teachers; salary schedules; professional preparation of teachers; administrative relationships of teachers and principals; supervision; teachers' meetings; text-books; organizations of high-school institutes and conferences; provision for individual differences; principals' reports. M.T.W.T.F., 2; 312 U.H. (2½). Assistant Professor Belting

Courses for Graduates

S104. Seminar in Problems in Educational Administration.—W., 4-6; 103 L.H. (½ unit). Dean Chadsey

S106. Seminar in High-School Administration.—Discussion and investigations of the following problems: State aid to secondary education; finance, taxation, revenues, bonds; buildings; equipment; records. T., 4-6; 103 L.H. (½ unit). Assistant Professor Belting

S121. Seminar in Educational Measurements.—M., 4-6; 103 L.H. (½ unit). Associate Professor Monroe

S125. Seminar in Educational Psychology.—Th. 4-6; 103 L.H. (½ unit). Professor Cameron

ENGLISH

A. LANGUAGE AND LITERATURE

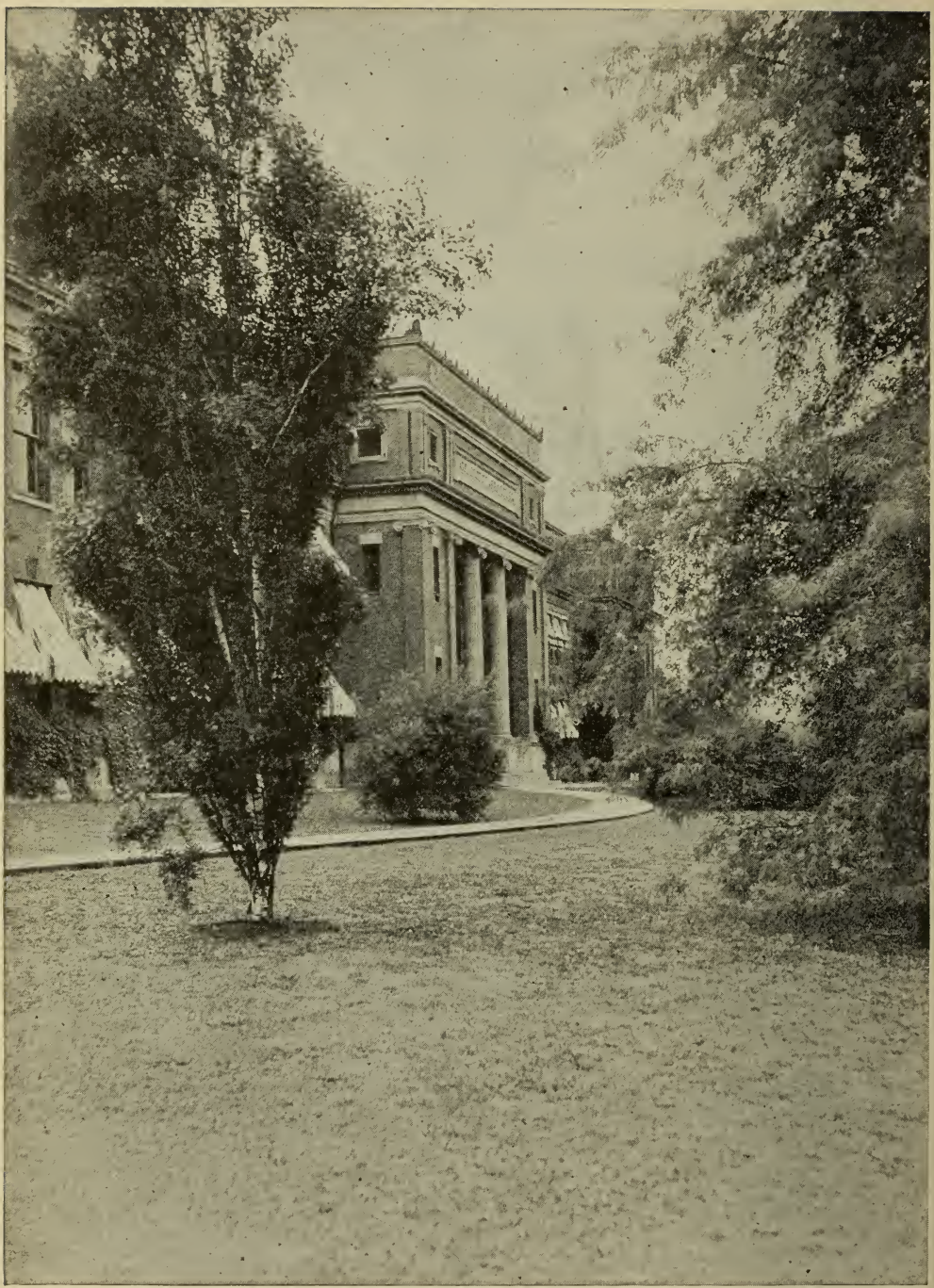
Associate Professor Paul, Assistant Professor Baldwin, Professor Ryan, Dr. Knowlton, Mr. Bredvold, Mr. Dolch, Mr. Diffenbaugh.

Courses for Undergraduates

S2a. Historical Survey of English Literature.—First part of the nineteenth century. Wordsworth, Coleridge, Lamb, Scott, Jane Austen, Byron, Shelley, Keats, Macaulay, Carlyle, etc. Text: *Century Readings in English Literature* (Part II). M.T.T.F., 9; 307 U.H. (2). Dr. Knowlton

Prerequisite: One year of college work or the equivalent.

Equivalent: First half of English 2. (Together with S2b this course covers the work of English 2. To be credited as equivalent to English 2, S2a and S2b must be taken simultaneously).



AGRICULTURAL BUILDING

S2b. Historical Survey of English Literature.—Second part of the nineteenth century. Tennyson, Browning, Arnold, Swinburne, Morris, Dickens, Thackeray, Eliot, Hardy, Stevenson, etc. Text: *Century Readings in English Literature* (Part II). M.T.T.F., 11; 307 U.H. (2), Mr. Bredvold

Prerequisite: One year of college work or the equivalent.

Equivalent: Second half of English 2 (See note under S2a).

S12. American Literature.—Bryant, Irving, Cooper, Hawthorne, Emerson, Poe, Longfellow, Lectures, discussions, readings, and reports. Text: Page's *Chief American Poets*. M.T.W.T. 1; 202 L.H. (2). Associate Professor Paul

Prerequisite: Six hours of English Literature or junior standing.

Equivalent: English 12.

S23. Shakespeare.—Two Gentlemen of Verona, Midsummer Night's Dream, Richard III, Romeo and Juliet, Twelfth Night, Othello, Lear, Tempest. Text: *The Hudson Shakespeare*. M.T.W.T., 2; 202 L.H. (2). Associate Professor Paul

Prerequisite: Six hours of English Literature or junior standing.

Equivalent: English 23 (in part).

S29. English Literature from 1557 to 1688, Exclusive of the Drama.—This course takes up the non-dramatic poetry of the 16th and 17th centuries, including the romantic epic and the lyric, but excluding Milton. It also traces the development of English prose from Lyly to Dryden, including Bacon, Bunyan, and Sir Thomas Browne. M.T.W.T.F., 10; 110 L.H. (2½). Assistant Professor Baldwin

Prerequisite: Six hours of English literature.

Equivalent: English 29 (in part).

Courses for Graduates and Advanced Undergraduates

S3. The Poetry of Milton.—All Milton's poetry will be read, both as an expression of the life of the age and as an expression of Milton's genius. M.T.W.T.F.S., 11; 110 L.H. (3). Assistant Professor Baldwin

Prerequisite: Two years of college work and the consent of the instructor.

Equivalent: English 3.

S25. Chaucer.—Chaucer's poetry is studied with particular attention to mediaeval ideals and to English society in the fourteenth century. Text: Skeat's *Students' Chaucer*. M.T.W.T.F.S., 10; 218 L.H. (3) Dr. Knowlton

Prerequisite: Two years of college work and the consent of the instructor.

Equivalent: English 25.

Courses for Graduates

S101. Research in Special Periods.—Individual conferences arranged with graduate students engaged upon definite pieces of investigation. (1 unit).
Associate Professor Paul, Assistant Professor Baldwin

S136. The Transition from the Seventeenth to the Eighteenth Century, 1675-1725.—The Rise of Classicism. (½ unit). Two hours a week. 1-3 F. 110 L.H.
Associate Professor Paul

B. RHETORIC

Mr. Bredvold, Mr. Dolch, Mr. Diffenbaugh

Courses for Undergraduates

S1. Rhetoric and Themes.—Principles of structure; grammar; punctuation; the sentence; reasoning processes. Four short themes a week and an occasional long theme. Oral and written exercises. Texts: Wooley's *Handbook of Composition*, and Canby's *English Composition*. M.T.W.T.F.S., two sections; A at 8, B at 9; 309 U.H. (3). Mr. Diffenbaugh

Prerequisite: Entrance credit in English.

Equivalent: Rhetoric 1.

S2. Rhetoric and Themes.—Principles of argumentation, narration, and description. Text: Scott and Zeitlin's *College Readings*. M.T.W.T.F.S., 10; 308 U.H. (3). Mr. Dolch

Prerequisite: Rhetoric 1.

Equivalent: Rhetoric 2.

S3. Exposition.—Themes or topics of general interest; analysis of facts and ideas, literary reviews and criticisms; informal essays. Intended for those who write correctly yet desire further practise in composition. M.T.W.T.F.S., 8; 110 L.H. (3). Mr. Bredvold

Prerequisite: Rhetoric 1-2.

Equivalent: Rhetoric 3.

S10. Business Writing.—Correspondence; sales letters; practise in writing business reports and summaries. Lectures and discussions. (Not counted toward a major in English). M.T.T.S., 11; 302 U.H. (2). Mr. Dolch

Prerequisite: Rhetoric 1-2.

Equivalent: Rhetoric 10.

C. PUBLIC SPEAKING

Professor Ryan

S1. Oral Expression.—Vocal methods, relation of the voice to the interpretation of thought. M.T.T.F., 8; 318 U.H. (2). Professor Ryan

Prerequisite: Rhetoric 1 and 2 or equivalent.

Equivalent: Public Speaking 1.

(Credit is not given for this course unless it is followed by Public Speaking 2, 10, or their equivalents.)

S10. Interpretation and Dramatization.—Oral reading of types of literature; principles of stage action; staging and acting of several one act plays. (Attention of those who register in this course is called to English S23.) M.T.T.F., 11; 318 U.H. (2). Professor Ryan

Prerequisite: Public Speaking 1 or equivalent.

Equivalent: Public Speaking 10.

S11. Problems in the Teaching of Oral English.—Primarily for high-school teachers. M.W., 9; 318 U.H. (1). Professor Ryan

Prerequisite: The consent of the instructor.

ENTOMOLOGY

Assistant Professor Folsom, Dr. Glasgow

Courses for Undergraduates

S1. General Entomology.—Introduction to the study of insects in field and laboratory. Collection methods and methods for the preservation and preparation of insects for study. The structure, interrelations, origin, development, and classification of insects. Recognition of the commoner species and their work, including forms injurious to field and garden crops and to the health of man and animals. Species of economic importance will be used for illustrative material wherever pertinent. Lectures, demonstrations; laboratory; field trips; assigned reading. Text: Folsom's *Entomology, with reference to its Biological and Economic Aspects.* M.W.F., 1, 2, and T.T., 3; 408 N.H. (2). Dr. Glasgow

S3. Economic Entomology.—Life history and habits of the commoner injurious insects. Methods of control. Lectures; demonstrations; assigned readings. Text: Sanderson's *Insect Pests of Farm, Garden, and Orchard.* M.W.F., 4; 408 N.H. (1). Dr. Glasgow

Prerequisite: May be taken only by students registered at the same time in course S1.

Equivalent: (Together with S1) Entomology 4.

S5. Insects of the Vegetable Garden.—Practical studies of habits, development, and control of insects affecting vegetables. Text: Crosby and Leonard's *Manual of Vegetable Garden Insects*. T.W.T.F., 3,4; 104 Vivarium. (2). Assistant Professor Folsom

Course for Advanced Undergraduates and Graduates

S2. Advanced Course.—Instruction to meet the purposes of the individual student. T.W. T.F., 1,2; or arrange; 104 Vivarium. (2 or 3). Assistant Professor Folsom

Courses for Graduates

S108. Research in Economic Entomology.—Twice a week; arrange. (1 or 2). Assistant Professor Folsom

GERMAN

Professor Lessing, Assistant Professor Williams

Courses for Undergraduates

S1. Beginners' Course.—Text: Schmidt and Glokke's *Das erste Jahr Deutsch* (Heath). M.T.W.T., 1,2; 215 L.H. (4). Professor Lessing

Equivalent: German 1 or one year of high-school German.

S4. Prose Reading.—Narrative prose, sight reading, composition. M.T.W.T., 3; 205 L.H. (2). Assistant Professor Williams

Prerequisite: German 3 (or 2), or two years of high-school German.

Equivalent: German 4 (in part).

S6. Scientific Prose.—Rapid reading of a general scientific character. M.T.W.T., 4; 205 L.H. (2). Assistant Professor Williams

Prerequisite: German 4 or three years of high-school German or equivalent.

Equivalent: German 6, (in part).

HISTORY

Professor Benton, Professor Lybyer, Professor Olmstead

Courses for Undergraduates

S1b. European History, 1713-1815,—The Eighteenth Century, the French Revolution and Napoleon I. M.T.W.T., 8; 305 L.H. (2). Professor Lybyer

Equivalent: The second one-fourth of History 1a-1b.

S3b. American History, 1815-1877.—National development, the westward movement, the controversy over slavery, the Civil War, reconstruction. M.T.W.T.F., 10; 305 L.H. (2½). Professor Benton

Prerequisite: Sophomore standing.

S50a. The Ancient World.—The beginnings of human development, the periods of pre-history, the early Orient. Special attention will be devoted to the significance of the period studied in relation to the Biblical records and of the later European connections. M.T.W.T.F.S., 11; 311 L.H. (3). Professor Olmstead

Prerequisite: Sophomore standing or the consent of the instructor.

Equivalent: The first half of 50, the Ancient World.

Courses for Advanced Undergraduates and Graduates

(At least junior standing is required for all the courses in this group.)

S20b. The Great War.—Its causes, especially in international relations and ambitions since 1891; a sketch of the war itself; the Peace Conference of 1919 and subsequent events in Europe. M.T.W.T., 9; 305 L.H. (2). Professor Lybyer

Prærequisite: One college course in history.

S14b. The Struggle between Conservative and Radical Forces in the Critical Period of American Constitutional History, 1776-1796.—The political ideals in the Revolutionary movement; conflict between the frontier and the East in state constitution making; problems in developing an effective central government; progress under the Articles of Confederation; the movement for a stronger national organization; organization of a national system of government; the rise of the Republican Party. M.T.W.T.F., 8; 311 L.H. (2½). Professor Benton

Prerequisite: Junior standing, including one college course in American history, or the consent of the instructor.

S55. The Roman Empire.—The political theories of the Augustan empire, the cultural development, the religious invasion from the Orient, the conquest by Christianity, the causes of the decline and fall, the survivals. M.T.W.T., 10; 311 L.H. (2). Professor Olmstead

Prerequisite: Junior standing.

Courses for Graduates

S101. Research in American History.—Personal conferences with graduate students who desire guidance in research. (½-1 unit). Professor Benton

S104. Research in European History.—Personal conferences with graduate students who desire guidance in research. (½-1 unit). Professor Lybyer

S150. Research in Oriental History.—Personal conferences with graduate students who desire guidance in research. (½-1 unit). Professor Olmstead

HOME ECONOMICS

Miss Anders, Miss Newton

S4. Clothing.—(Corresponds with Home Economics 12 in the regular year.) Demonstrations and laboratory work in methods of drafting, cutting, fitting, and making of garments from individual designs. (Prerequisite to Home Economics 34.) Laboratory, 8,9,10, M.W.F., 8,9,T.T., 205 W.B. (3). Miss Newton

Prerequisite: Home Economics 19. Proof by examination of ability to do plain sewing.

S6b. Elementary Home Decoration.—(Corresponds with Home Economics 3 in the regular year.) Theory of color and its application in home decoration; furnishings from a sanitary and artistic standpoint. Laboratory 8,9,10, M.W.F.; Lecture and discussion 9, T.T., 121 W.B. (3).

Prerequisite: Home Economics 2; Art and Design 12.

S12. Teachers' Course.—(Corresponds with Home Economics 11 in the regular year.) The development of Home Economics as one of the factors in the education of women. Methods of presenting the work and its correlation with other subjects. Practise in planning courses and presenting lessons. Lecture and discussion. 10 M.W.F.; Laboratory 10,11 T.T.; 113 and 235 W.B. (3). Miss Anders

Prerequisite: For non-Smith-Hughes students: Home Economics 5, 12, 13, 34. For Smith-Hughes students: Home Economics 5, 13, 31.

INDUSTRIAL EDUCATION

Associate Professor Vaughn and Assistant Professor Mays

S3. Woodwork.—A general course in woodworking practise and methods, involving both handtools and machinery in woodworking projects adapted to the needs and purposes of the class. M.T.W.T.F., 8-10; W.S. (2½).

S4. Organization and Administration of the Part-time School.—A general survey of legislation, types of organization, problems of administration, the curriculum, and other problems peculiar to the part-time school. M.T.W.T.F., 9; 208 U.H. (2½).

S50. Survey of Industrial Education.—A brief survey of industrial education in the United States with some reference to European movements that have influenced the work in this country. A study of the Smith-Hughes Law and the Illinois plans and provisions for the establishment of industrial education. Method of attack in trade and job analysis and in classifying industrial content for instructional purposes. M.T.W.T.F., 1; 211 L.H. (2½).

S52. Teaching Related Technical Subjects.—Discussion of aims and methods best adapted to teaching such subjects as mathematics, science, drawing, when applied in industrial schools and classes. Practise in analyzing and classifying the content of such subjects for instructional purposes, and in relating the same to industrial content similarly analyzed and classified. Lesson planning. M.T.W.T.F., 2; 214 U.H. (2½).

Prerequisite: Junior standing and consent of the instructor.

S54. Teaching General Continuation Subjects.—Discussion of aims and methods best adapted to teaching such subjects as industrial history, geography, economics; English; sanitation, safety, and hygiene; citizenship; as well as practical commercial subjects in general continuation part-time schools and classes. Practise in analyzing and classifying content of such subjects for instructional purposes. Lesson planning. M.T.W.T.F., 3; 214 U.H. (2½).

Prerequisite: Junior standing or consent of instructor.

S56. Teaching Shopwork.—Discussion of aims and methods best adapted to teaching shopwork in industrial schools and classes and on the job. Practise in analyzing and classifying trade and industrial content for effective instruction. Lesson planning; management. Designed especially for persons with trade experience. M.T.W.T.F., 3; 214 U.H. (2½).

S62. Content and Methods of the Industrial Arts.—A study of the development of the manual and industrial arts; an analysis of their objectives; an organization of the subject matter; and a discussion of the methods employed in the elementary, part-time and high-schools. M.T.W.T.F., 10; 208 U.H. (2½).

CONFERENCES ON PART-TIME SCHOOL PROBLEMS

Discussions of problems of finance, legislation, types of organization, tests, teacher-training and selection, trade extension work, employers' attitude, attendance, etc., led by Dean Chadsey, Professor Buckingham, Dr. Belting, Associate Professor Vaughn, representatives of State Board for Vocational Education, and others. 4-6 Th., first four weeks of the session; 228 N.H.

LIBRARY SCIENCE

Director Windsor, in charge, Mr. Cleavinger, Miss Bond, Miss Boyd, Mrs. Taylor

Eight-Weeks Courses for College Graduates

Courses of the regular two-year curriculum are offered to college graduates who can satisfy the entrance requirements. These courses are accepted for credit toward the B.L.S. degree. Admission to these courses is conditional on the presentation of credentials showing that the applicant holds a bachelor's degree in arts or science from the University of Illinois or has had other equivalent training.

Application blanks for admission must be secured and these should be filled out and returned to the Director of the School, together with such additional statements as the candidate may offer, showing his qualifications for admission. The application must be filed sufficiently early to enable the School to receive replies from librarians and others who have personal knowledge of the applicant.

S2a. Reference.—A study of reference books, including those in foreign languages. These reference books are considered in groups; for example, dictionaries, cyclopedias, periodical indexes, atlases, hand-books of statistics, handbooks of general information; reference lists are prepared by the students; a selection is made of reference books suitable for the home and for libraries of different types. M.T.W.T.F.S., 9; (3).

S3a. Selection of Books.—The principles underlying the selection of books for different types of libraries. The various aid used in book selection. Practise in the writing of annotations and reviews. The reading or careful examination of books on a wide range of subjects. M.T. T.S., 10; (2).

S16. Order, Accession, and Shelf Work.—The subjects included in this course are book-buying, discounts, ordering books, checking and entering bills, the accession book and its substitutes, the shelf list, serials and continuations, exchanges, gifts, duplicates, pamphlets, clippings, the history of copyright and the copyright law. Instruction in these topics is followed by practise in the making of their respective records. M.T.T.F., 11; (2).

S30. Practise.—Work in the various departments of the University library. (3).

Prerequisite: Library 17 and 18.

Six-Weeks course for High-School Graduates

These courses are open (1) to librarians, library assistants, and teacher-librarians, and to others under definite appointment to such positions; and (2) to others, with the consent of the Director, who have completed one year of study in a college or normal school. There are no entrance examinations, but in all cases the completion of a four-year course in an accredited high school or its equivalent is required. No credit toward a degree is given for the work, but a statement of grades is issued by the Registrar of the University.

The subjects in which instruction is given are grouped under the following heads. Two hours of study are expected of the student in preparation for each class hour. These courses, taken together, occupy all the working hours of the student.

S1. Classification, Cataloging, Book Numbers.—Practise in classifying books according to the Dewey Decimal Classification, and the preparation of a dictionary catalog. *Five class hours a week.*

S32. Reference Work.—The more important books of reference, and particularly those suited to the small public library. *Three class hours a week.*

Prerequisite: Employment as librarian or registration in S1.

S3. Selection of Books.—The principles of book selection, with discussion of the literature of special subjects by members of the University faculty. *Two class hours a week.*

S4. Libraries and Children.—Management of children's rooms; work with schools; selection of children's literature, illustrated by the use of a good collection of children's books. *Two class hours a week.*

S5. Order, Accession, etc.—Order, accession, shelf, and loan records; trade bibliography; the checking of periodicals; mechanical preparation of books; mending and repair. *Two class hours a week.*

S6. Library Administration and Extension.—Lectures and round table discussions of library rules, accounts, finance, extension methods and laws, and of buildings and equipment. *Two class hours a week.*

MATHEMATICS

Professor Coble, Assistant Professor Kempner, Assistant Professor Wahlin, Dr. Steimley, Mr. Pettit, Mr. McFarlan, Mr. Hurst

The department offers at least five courses each summer for graduates and advanced undergraduates. These courses vary from year to year so as to enable advanced students to secure a suitable sequence of courses during four or five successive summer sessions. Three of these courses are of intermediate grade, being open to advanced undergraduates, while the other two are primarily for graduate students.

Mathematics Library and Models

The Mathematics Library now contains more than 6,000 volumes. Fifty current mathematical periodicals are received in addition to a large number of serials devoted partly to mathematics and available in the general library. The Mathematics Library will be open to all students

during certain hours of each day except Sunday, but graduate students in mathematics can secure keys which will enable them to use this library whenever the outside doors of the Natural History Building, in which it is located, are open.

A large collection of mathematical models is exhibited in cases located in the halls adjoining the mathematics recitation rooms and the Mathematics Reading Room. This collection includes models relating to the following subjects: Quadratics of all kinds, surfaces of the third and fourth order, surfaces of high orders, line geometry, curves in space, differential geometry, descriptive and projective geometry, analysis situs, mechanics, and kinematics. It also includes devices and machines for mechanical computation, integration, and harmonic analysis.

The Mathematics Club will meet every Friday at 4 p.m. in Room 434 Natural History Building for the consideration of mathematical questions of general interest, especially questions relating to the teaching and the history of mathematics. These meetings will be open to all students who may be interested and will usually last for an hour.

Courses for Undergraduates

S2. College Algebra.—Text: Rietz and Crathorne's *College Algebra*. M.T.W.T.F.S., Section A, 11; 419 N.H.; Section B, 11; 422 N.H. (3). Mr. Pettit, Mr. Hurst

Prerequisite: Two and one-half units entrance requirements.

Equivalent: Mathematics 2.

S4. Plane Trigonometry.—Text: Young and Morgan's *Trigonometry*. M.T.W.T.F., Section A, 10; 419 N.H.; Section B, 10; 422 N.H. (2). Assistant Professor Wahlin, Mr. Hurst

S6. Analytical Geometry.—Introductory plane and solid analytic geometry. Text: Crawley and Evans' *Analytic Geometry*. M.T.W.T.F., 10 and 11; 418 N.H. (5). Mr. McFarlan

Prerequisite: Mathematics 2 and 4.

Equivalent: Mathematics 6.

S7. Differential Calculus.—Course for beginners. Townsend and Goodenough's *Essentials of Calculus*. M.T.W.T.F., 8 and 9; 423 N.H. (5). Dr. Steimley

Prerequisite: Mathematics 6.

Equivalent: Mathematics 7.

S9. Integral Calculus.—Text: Townsend and Goodenough's *Essentials of Calculus*. M.T.W.T.F.S., 9; 418 N.H. (3). Mr. Pettit

Prerequisite: Mathematics 7.

Equivalent: Mathematics 9.

Courses for Advanced Undergraduates and Graduates

S10. Theory of Equations and Determinants.—Determinants; systems of linear equations; algebraic equations. M.T.W.T.F., 9; 425 N.H. (2½). Assistant Professor Kempner

Prerequisite: Mathematics 9 or 9a.

Equivalent: Mathematics 10 (in part).

S17. Advanced Calculus.—Various topics from calculus and analysis. Text: Goursat-Hedrick's *Mathematical Analysis*. M.T.W.T.F., 8; 431 N.H. (2½).
Assistant Professor Kempner

S18. Projective Geometry.—The elements of synthetic and analytic projective geometry with applications to conics and quadrics. M.T.W.T.F., 11; 431 N.H. (2½). Professor Coble

Courses for Graduates

S120. Theory of Groups.—An introduction to the theory of groups and the Galois theory of algebraic equations. M.T.W.T.F., 9; 431 N.H. (1 unit). Assistant Professor Wahlin

S135. Metric Differential Geometry.—Curves and surfaces in parametric form; quadratic differential forms. M.T.W.T.F., 10; 431 N.H. (1 unit). Professor Coble

MECHANICS, THEORETICAL AND APPLIED

Mr. Ensign, Mr. Putnam

S20. Analytical Mechanics.—Statics, kinematics, centroids, and friction. Text: Seely and Ensign's *Analytical Mechanics for Engineers*. M.T.W.T.F.S., 10; 202 E.H. (3). Mr. Ensign

Prerequisite: Mathematics 7, registration in Mathematics 9.

S21. Analytical Mechanics.—Kinetics. Text: Seely and Ensign's *Analytical Mechanics for Engineers*. T.W.T.F., 1; 202 E.H. (2). Mr. Ensign

Prerequisite: Mathematics 9; Theoretical and Applied Mechanics 20.

S25. Resistance of Materials.—The mechanics and properties of materials used in construction experiments in testing laboratory; problems. Merriman's *Mechanics of Materials*. Quiz. M.T.W.T.F.S., 11; 202 L.A.M.; laboratory M.W., 8-10; L.A.M. (4). Mr. Putnam

Prerequisite: Mathematics 9; Theoretical and Applied Mechanics 20.

MUSIC

Director Erb, Miss Phillips, Mr. Johnson, Mr. van den Berg

S2. Musical History.—Eighteenth and Nineteenth Centuries. Collateral reference work and note books. T.T.; 9; 106 S.M.H. (1). Director Erb

Prerequisite: The consent of the instructor.

Equivalent: Music 2 (first half).

S3a. Harmony.—Triads and seventh chords, construction and connection; harmonization of figured bass and given melody in two clefs; original composition in simplest forms. T.T, 10; 103 S.M.H. (1). Director Erb

Prerequisite: Music S3.

Equivalent: Music 3 (second half).

S21a. Ear Training, Elementary Course.—Formation and recognition of intervals separately and in combinational rhythmic drill; melody making and writing. T.T., 11; 106 S.M.H. No university credit. Miss Phillips

Prerequisite: Entrance credit.

Equivalent: Music 21a (first half; second half to be given next summer).

S23a. Sight Singing.—Elementary course, music notation; scale structure; solfeggio. M.W., 9; 106 S.M.H. No university credit. Miss Phillips

Prerequisite: Entrance credit.

Equivalent: Music 23a (first half).

S25a. Public School Music Methods.—Problems of supervision in the grades; study of material and technic of teaching. M.T.W.T., 8,10; 106 S.M.H. (4). Miss Phillips

Prerequisite: Two years of sight reading and the consent of the instructor.

Equivalent: Music 25a.

S41c-41f. Introductory Course in Piano.—Arrange hours; 113 S.M.H. No university credit. Mr. van den Berg

Prerequisite: The consent of the instructor.

Equivalent: Music 41c-41f (in part).

S42-46. Piano, Collegiate Grade.—Arrange hours; 113 S.M.H. (1 or 2). Mr. van den Berg

Prerequisite: Three years of piano study.

Equivalent: Music 42-46 (in part).

S47. Piano, Collegiate Grade.—For students in other schools and colleges of the University. Arrange hours; 113 S.M.H. (1). Mr. VAN DEN BERG

Prerequisite: Three years of piano study.

Equivalent: Music 47 (in part).

S51c-51f. Introductory Course in Voice.—Arrange hours; 215 S.M.H. No university credit. Mr. JOHNSON

Prerequisite: The consent of the instructor.

Equivalent: Music 51c-51f (in part).

S52-56. Voice, Collegiate Grade.—Arrange hours; 215 S.M.H. (1 or 2). Mr. JOHNSON

Prerequisite: Three years of vocal study.

Equivalent: Music 52-56 (in part).

S57. Voice, Collegiate Grade.—For students in other schools and colleges of the University. Arrange hours; 215 S.M.H. (1). Mr. JOHNSON

Prerequisite: Three years of vocal study.

Equivalent: Music 57 (in part).

S81. Organ.—Arrange hours; 107 S.M.H. (1). Director ERB

Prerequisite: Three years of piano study or the equivalent.

Equivalent: Music 81 (in part).

S83. Organ.—For students in other schools and colleges of the University. Arrange hours; 107 S.M.H. (1). Director ERB

Prerequisite: Three years of piano study or the equivalent.

Equivalent: Music 83 (in part).

Students desiring to take organ will be obliged to pass without conditions the entrance examination for collegiate standing in piano.

Campus sings Wednesday evenings at 6:45, Auditorium steps.

PHYSICAL EDUCATION FOR MEN

Director HUFF, Assistant Professor ZUPPKE, Assistant Professor GRIFFITH, Mr. GILL, Mr. LUNDGREN, Mr. WINTERS, Mr. SCHUETTNER, Mr. BEARG, and Mr. BULLOCK

S10a. Baseball Theory.—Theory of batting; base running; proper methods of fielding each position; team work and coaching methods; study of the rules, and a general study of fundamentals. Th.F.S., 9. (1). Mr. HUFF, Mr. LUNDGREN

S10b. Baseball Practise.—The principles discussed in S10a will be practised in the various sections. Each section will meet three times a week. Sec. A, M.T.W., 4. (⅓). Sec. B., Th. F.S., 4. (⅓). Sec. C., M.T.W., 5. (⅓). Sec. D., Th.F.S., 5. (⅓). Mr. LUNDGREN

S11a. Track and Field Theory.—The theory of starting, sprinting, distance running, hurdling, high and broad-jumping, pole vaulting, shot putting, hammer, discus, and javelin throwing. Practical talks on the methods of preparing contestants for different athletic events; rules of competition; study of physical condition, including endurance, speed, and fatigue. Work is assigned for the promotion, management, and officiating of games and meets. Th.F.S. 8. (1). Mr. GILL

S11b. Track and Field Practise.—The principles discussed in S11a will be practised in the various sections. Sec. A, Th.F.S., 9; (⅓). Sec. B., Th. F.S., 10; (⅓). Sec. C., Th.F.S., 3; (⅓). Sec. D., Th.F.S., 4; (⅓). Mr. GILL, Mr. GRIFFITH

S12a. Basketball Theory.—Instruction will be given in basketball with the idea of fitting men to coach. The course will cover passing, goal throwing, dribbling, team play, how to condition a team, and the different styles of play used by the leading coaches. M.T.W., 10. (1). Mr. WINTERS

S12b. Basketball Practise.—The principles discussed in S12a will be practised in the various sections. Sec. A., M.T.W., 8. (⅓). Sec. B., Th.F.S., 8. (⅓). Sec. C., M.T.W., 2. (⅓). Sec. D., Th.F.S., 2. (⅓). Sec. E., M.T.W., 9. (⅓). Mr. Winters, Mr. Bearg

S13a. Football Theory.—The theoretical work will take up the rules from the standpoint of coaching, players, and officials; the several styles of offense and defense with consideration of their special strengths and weaknesses; generalship and strategy; training, conditioning, and player's equipment. M.T.W., 8,9. (2). Mr. Zuppke

S13a. Football Practise.—The practical work will include punting, drop kicking, place kicking kickoff, and forward passing; tackling dummy and charging sled; special drills for linemen, ends, and backs; following the ball, interference, and team work; fundamental plays, freak plays, and signal systems. Sec. A., M.T.W., 10. (⅓). Sec. B., Th.F.S, 10. (⅓). Sec. C., M.T.W., 11. (⅓). Sec. D., Th. F.S., 11. (⅓). Mr. Bearg

S14. Training.—Theories of training, massage, treatment of sprains, bruises, etc.; bandaging and first aid. Lectures and practical work. This course should be taken by all who take S10, S11, S12, or S13. Sec. A., Th.F., 1. (⅔). Sec. B., M.T., 2. (⅔). Sec. C., W.Th., 2. (⅔). Sec. D., M.T., 3. (⅔). Sec. E., W.Th., 3. (⅔). Mr. Bullock

S15. Calisthenics.—(Free Exercises). System, value, method, and progression. Typical lessons for corrective and responsive work. The use of wands, clubs, and dumb-bells. Emphasis to be laid on progression and method of presenting material. The simplest and most explanatory terminology. Theoretical and practical work. M.T.W., 3. (½). Mr. Schuettner

S17. Gymnastics.—Theory and practise in elementary exercises on heavy apparatus; mats, horse, horizontal bar, rings, and parallel bars. Accuracy of form and execution emphasized. The chief purpose is to teach a large variety of rapid mass work adapted to the average class. The laws of gymnastic progression. Nomenclature and analysis of exercise. Theory and practise. M.T.W., 2. (½). Mr. Schuettner

S19. Organization and Administration.—Including lectures on purposes of physical education, methods, and tests; organization of a department, administration, paper work. Th.F.S., 2. (1). Mr. Griffith

S21. Gymnastic Dancing.—Theory and practise. System, progression, and method of presenting gymnastic dance steps for class or individual instruction. Theory, personal proficiency, and practise teaching. Th.F., 3,4. (1). Mr. Schuettner

S24. Swimming.—Theory and practise, including confidence methods, the breast stroke, side stroke, crawl stroke, back stroke, diving, water basketball, water polo, and life saving. Sec. A., M.T.W., 4. (⅓). Sec. B., Th.F.S., 4. (⅓). Sec. C., M.T.W., 5. (⅓). Sec. D., Th.F.S., 5, (⅓). .....

PHYSICAL EDUCATION FOR WOMEN

Director Freer, Miss Bussell

S1. Hygiene.—Teaching of school hygiene. Lectures and reports. T.T., 11. (½). Miss Freer

S2. Gymnastics.—Formal and natural, including gymnastic games suitable for girls and boys in the elementary and high school. T.W.T.F., 3. (1). Miss Freer, Miss Bussell

S3. Community Recreation.—Social games for large and small groups. M.W., 2. (½). Miss Freer

S4. Folk Dancing.—Simple and more difficult national folk dances. T.T.F., 2. (½). Miss Freer

S5. Advanced Dancing.—M.W.F., 4. (½). Miss Bussell

S6. Coaching of Games.—Basketball, tennis, baseball. T.T., 4, (½). Miss Freer

S7. Swimming.—M.T.W.T.F., 10,11,2,3,4. Miss Bussell

PHYSICS

Professor Knipp, Mr. Nelson, Mr. Ham, Mr. Schmidt

S7I. General Physics, Part I.—Lectures with experimental demonstrations and recitations on mechanics, including the fundamental laws of motion, forces and their effects, equilibrium, etc. (For students in Arts and Sciences). Text: Kimball's *College Physics*. M.W.F.,10; Lecture Room, 100 Physics. (1½). Professor Knipp

Prerequisite: Plane geometry and high-school algebra; registration in Physics S8I. Plane trigonometry desired.

Equivalent: S7 (I, II, III) together with S8 (I, II, III) are equivalent to Physics 7a-7b, 8a-8b, or to Physics 9a-9b, 10a-10b for the college year.

S8I. Introductory Laboratory Physics, Part I.—A laboratory course in physical measurements on mechanics, properties of matter, forces, equilibrium, etc., to accompany S7I. Text: Schulz's *Laboratory Manual*. T.T.S., 10-12; 212 Physics. (1½). Mr. Nelson

Prerequisite: Registration in Physics S7I.

Equivalent: See S7I.

S7II. General Physics, Part II.—Experimental lectures with recitations on electricity and magnetism. Text: Kimball's *College Physics*. T.T.S., 9; Lecture Room, 119 Physics. (1½). Professor Knipp

Prerequisite: See S7I.

Equivalent: See S7I.

S8II. Introductory Laboratory Physics, Part II.—Laboratory experiments in electricity and magnetism to accompany S7II. Text: Schulz's *Laboratory Manual*. M.W.F., 8-10; 212 Physics. (1½). Mr. Ham

Prerequisite: Registration in S7II.

Equivalent: See S7I.

S7III. General Physics, Part III.—Heat, light, and sound. Text: Kimball's *College Physics*. M.W.F., 11; Lecture Room, 119 Physics. (1½). Mr. Nelson

Prerequisite: Same as S7I.

Equivalent: See S7I.

S8III. Introductory Laboratory Physics, Part III.—Laboratory experiments in heat, light, and sound to accompany S7III. Text: Schulz's *Laboratory Manual*. M.W.F., 2-4; 212 Physics. (1½). Mr. Ham

Prerequisite: Registration in Physics S7III.

Equivalent: See S7I.

S44a. Electrical and Magnetic Measurements.—Accurate measurement of resistance by commutating Wheatstone bridge, the Carey Foster bridge, and the Kelvin double bridge; insulation resistance; aperiodic and ballistic galvanometers; electric current and quantity; electric capacity. Discussions, recitations, and reports. Four 3-hour laboratory periods, M.T.T.F., 1-4; 112 Physics. (3) Professor Knipp, Mr. Schmidt

Prerequisite: A course in general physics and calculus.

Equivalent: This course is the equivalent of the first semester of Physics 44a.

S15. Electricity and Magnetism.—Lectures, recitations, and laboratory. This course is recommended to students who wish a broader and more accurate knowledge of electrical phenomena and theory than that given in the courses on general physics. Text: Brooks and Poyser's *Magnetism and Electricity*. M.W., 8; F., 8-11; 108 Physics. (1½). Mr. Schmidt

Prerequisite: A course in general physics.

Equivalent: Physics 15 (in part).

S16. Heat.—Lectures and recitations on fundamental heat phenomena accompanied by laboratory experiments in thermometry, calorimetry, transmission of heat, mechanical equivalent of heat, expansion, vapor pressure, etc. This is an intermediate course recommended to students who have already had a course in general physics and desire a more extended knowledge of heat. Text: Draper's *Heat.* T.T., 8; S., 8-11; 213 Physics. (1½). Mr. Nelson

Prerequisite: A course in general physics.

Equivalent: Physics 16 (in part).

S17. Light.—A course of lectures and recitations on reflection, refraction, interference, diffraction and polarization, followed by laboratory experiments on these phenomena, and the theory and use of optical instruments, such as telescopes, microscopes, refractometers, prism and grating spectroscopes, interferometers, etc. Text: Edser's *Light for Students.* (½). Not given in 1921.

Prerequisite: A course in general physics.

Equivalent: Physics 17 (in part).

S18. Teachers' Course.—Practical laboratory manipulation, such as glass blowing, minor repairs of apparatus, preparation of direction sheets, etc. Th. 1-5; 213 Physics. (½). Mr. Ham

Prerequisite: A course in general physics, or teaching experience.

Equivalent: Physics 18 (in part).

S21. Recent Advances and Applications in Physics.—Popular lectures, illustrated by experiments, on recent advances and applications of physics. These lectures are open to the public and may be attended by those interested. They are to be given by members of the instructional staff and others. One half hour credit may be obtained by students registering in the course. Brief abstracts of the lectures in addition to an examination of the main facts presented will be required. Th., 6-45-8:00 p.m.; Lecture Room, 100 Physics. (½).

Professor Knipp and Mr. Nelson in charge.

The subjects and dates follow:

Measuring the Diameters of Stars. Thurs., June 23, 6:45; 100 Physics. Professor Stebbins

The Tones of Bells (Lantern, experiments.) Thurs , June 30, 6:45; 100 Physics. Professor Watson

Methods of Measuring High Temperatures (Experiments). Thurs., July 7, 6:45; 100 Physics. Mr. Nelson

Factors Affecting the Structure of Electrodeposited Metals (Lantern). Thurs., July 14, 6:45; 100 Physics. Mr. Ham

The Measurement of the Properties of an Electron (experiments). Thurs., July 21, 6:45; 100 Physics. Mr. Schmidt

Detectors of Electric Waves in Wireless Telegraphy. Thurs., July 28, 6:45; 100 Physics. Mr. Hartsough

Liquid Air and Allied Phenomena (Experiments). Thurs., Aug. 4, 6:45; 100 Physics. Professor Knipp

A physics exhibit will be held immediately following the lecture on August 4. The laboratories, research rooms and the department shop will be open for inspection. It is planned to have a limited number of instructive experiments on exhibition.

S24. Properties of Matter.—The fundamental properties of matter, weight, mass, gravitation, elasticity, viscosity, surface tension and diffusion. Lectures and recitations. Laboratory measurements including the use of the dividing engine, chronograph, etc. Text: Poynting and Thomson's *Properties of Matter.* (1½). Not given in 1921.

Prerequisite: A course in general physics.

Equivalent: Physics 24 (in part).

S26. Physics Teachers' Colloquium.—A discussion in colloquium of the problems which the teacher of physics in the high school encounters, including methods of class conduction; criticisms of high school text books of physics; organization of laboratory work; selection of experiments and accompanying apparatus, etc. Part of the work will be in the shape of short papers by members of the colloquium on assigned topics. Tu., 4; 201 Physics. (½).
Professor KNIPP, Mr. NELSON

Prerequisite: Enrollment in one of the physics courses.

Courses for Advanced Undergraduates and Graduates

S31. Special Problems in Advanced Physical Measurements.—Special laboratory problems such as the accurate determination of the coefficient of viscosity of liquids and gases; of the elastic constants of metals; of the coefficient of self-induction, L, of a coil; of the capacity, C, of a condenser in absolute measure; the calibration of a bridge wire; the use of a dividing engine, etc. Text: Various laboratory manuals. Arrange time. (1, 1½, 2). Professor KNIPP

Prerequisite: A course in general physics, elementary calculus.

Courses for Graduates

S131. Investigation of Special Problems.—This course is available for students who are working toward or who have taken their advanced degrees, and consists of individual special problems which will be under the general supervision of one of the professors. The work done should show originality in method, or should contribute new data in experimental investigation. Arrange time. (1, 1½, or 2). Professor KNIPP

S133. Seminary and Thesis.— Professor KNIPP

Prerequisite: Registration in Graduate School. See instructor.

POLITICAL SCIENCE

Associate Professor STORY

Course for Undergraduates

S3. State Government.—Relations between nation and state; organization and work of the electorate; constitution making; institutions, organs, and agencies of government and their work. M.T.W.T.F., 2; 317 L.H. (2½). Associate Professor STORY

Prerequisite: Thirty hours of university work.

Equivalent: Political Science 3 except local government.

Course for Advanced Undergraduates and Graduates

S4. Municipal Government.—Growth of cities; their legal status; municipal organization in the United States including mayor and council, commission, and city manager forms; municipal functions and services. M.T.W.T.F., 3; 317 L.H. (2½). Associate Professor STORY

Prerequisite: Junior standing.

Equivalent: Political Science 4 except municipal government abroad.

Course for Graduates

S103. Research in Political Science.—For graduate students who wish to investigate special topics. Conferences to be arranged. (½-1 unit). Associate Professor STORY

See also History S14b, M.T.W.T.F., 9; 311 L.H. (2½).

NATURAL HISTORY BUILDING

PSYCHOLOGY

Dr. Griffith, Mr. Marston, Miss Rutherford

Courses for Undergraduates

S1. Introduction to Psychology.—The facts and laws of mind. Sensation and image, perception, attention, memory, emotions, action, and thought. Lectures, illustrated with experimental demonstrations, and discussion. Text: C. A. Ruckmick's *Brevity Book on Psychology*. M.T.W.T.F., 10; 410 U.H. (2½). Dr. Griffith, Mr. Marston

Prerequisite: Sophomore standing or consent of the instructor.

Equivalent: Psychology 1 (in part).

S2. General Psychology.—The genetic inheritance of mind; relation of psychology to the physiological, medical, biological, and social sciences; habit, instinct, illusion, hallucination, dream, and other special problems; abnormal psychology; applications of psychology to the arts, professions, and industries: M.W.F., 8; 410 U.H. (1½). Miss Rutherford

Prerequisite: Psychology 1 or the equivalent.

Equivalent: Psychology 2 (in part).

S16. Genetic Psychology.—Instinctive responses, formation of habits, and development of the psychosomatic functions in the child from birth to maturity. Lectures; collateral reading; discussions. M.W.F., 8; 202 L.H. (1½) Mr. Marston

Prerequisite: Psychology 1 and 2.

Equivalent: Psychology 16.

Course for Advanced Undergraduates and Graduates

S13. Minor Problems.—Individual investigations in the form of essay or experiment. Some small problem will be offered for investigation in a field in which the student is interested and opportunity will be afforded to gain practise in observing in other researches under way. Hours to be arranged. 507 U.H. (1-2). Dr. Griffith

Prerequisite: The equivalent of Psychology 1 and one other course, preferably training in elementary laboratory experiments, or consent of the instructor.

Equivalent: Psychology 13.

S25. Psychology and Athletics.—Designed primarily for students in the Athletic Coaching School. Psychological analysis of the sports; the mind of the athlete; the development and maintenance of morale; individual differences in psychosomatic performance; the nature of play; the maintenance of mental health. Lectures and discussions. M.T.W.T., 2; 410 U.H. (2). Dr. Griffith

Prerequisite: Psychology 1 or the consent of the instructor.

ROMANCE LANGUAGES

Professor Oliver, Assistant Professor Van Horne, Assistant Professor Cheydleur, Mr. Soto, Mr. Haumont

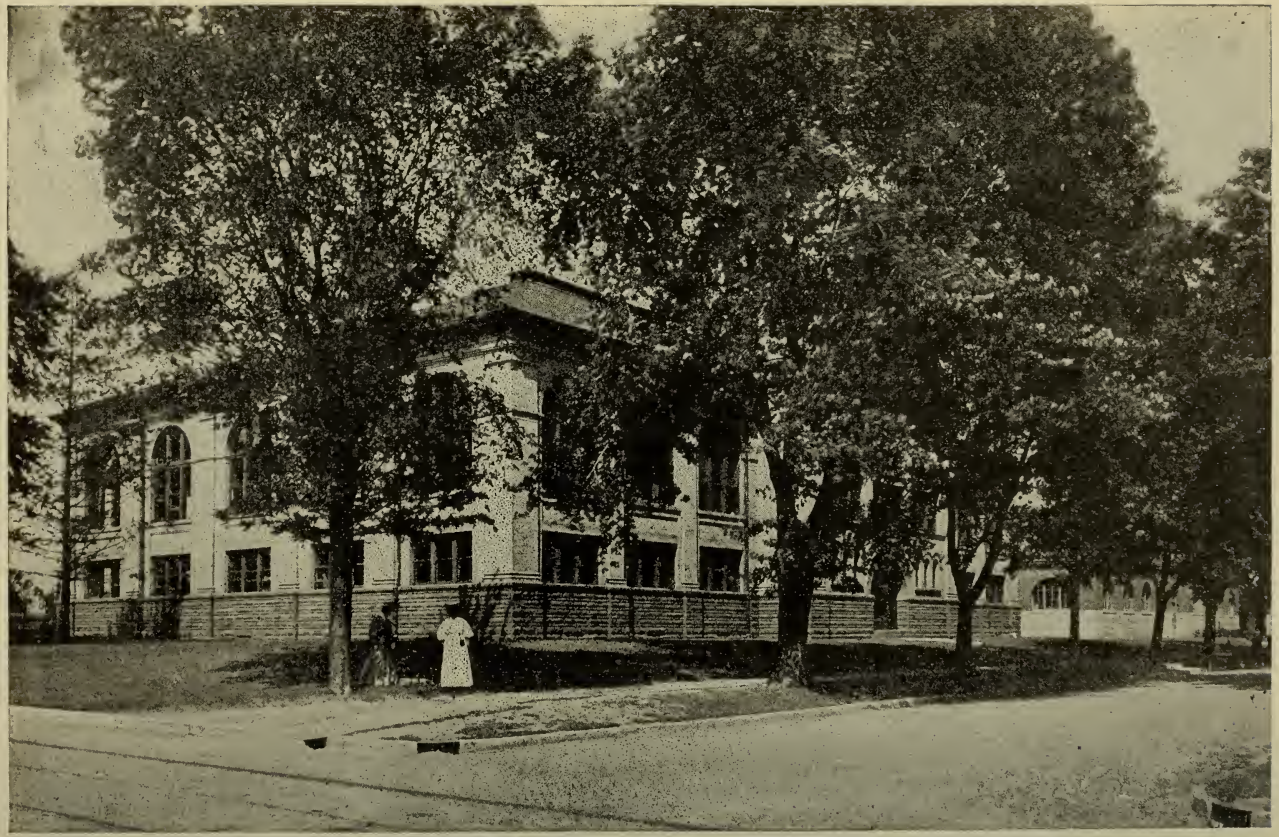
A. FRENCH

S1a. Elementary Course.—Pronunciation, grammar, reading of easy prose. Section A; T.W.T.F., 8,9; Section B; T.W.T.F., 10,11; 117 L.H. (4).
Assistant Professor Cheydleur, Mr. Haumont

Equivalent: French 1a or one year of high-school French.

S2a. Modern Prose and Drama.—Rapid reading of modern authors; review of grammar; composition and syntax. T.W.T.F., 8; 218 L.H. (2). Professor Oliver

Note: Students who have had French S2a in a previous Summer Session with different reading will be admitted to this course for full credit, but must do additional work outside the class.



GYMNASIUM

Superior students may earn three credits in this course by taking S4 in addition; they may earn four credits by taking S4 and doing supervised reading to the extent of one hour's credit.

Prerequisite: One year of college French or the consent of the instructor.

Equivalent: French 2a (in part)

S4. Advanced Grammar and Syntax.—Special attention to the chief difficulties of modern French syntax. Armstrong's *Syntax of the French Verb* will form the basis of the work. This course is recommended to prospective teachers of French. T.T., 10; 114 L.H. (1).
Professor Oliver

Note: See the note under S2a.

Prerequisite: One year of college French, or its equivalent, with minimum grade of B.

S7a. Intermediate Composition and Conversation.—Study and practise of idiomatic expression in speaking and writing. T.W.T.F., 9; 113 L.H. (2). Mr. Haumont

Prerequisite: Two years of French or the consent of the instructor.

Equivalent: French 7a.

S9a. The French Novel of the Present Day.—Bourget; France; Loti; Bordeaux. Lectures. Outside reading. Reports. T.W.T.F., 11; 211 L.H. (2). Assistant Professor Cheydleur

Prerequisite: Two years of college French and the consent of the instructor.

Course for Graduates

A cycle of four courses dealing with French literature of the seventeenth, eighteenth, and nineteenth centuries, will be given in four successive summer sessions.

S123. Eighteenth Century French Drama.—Lectures and interpretations. Reports on assigned topics of investigation. M.T.W.T., 9; 114 L.H. (1 unit). Professor Oliver

Prerequisite: Three years of college French and the consent of the instructor.

B. SPANISH

S1a. Elementary Course.—Pronunciation, grammar, reading of easy prose. Hills and Ford's *First Spanish Course;* Bergé-Soler and Hatheway's *Elementary Spanish-American Reader.* T. W.T.F., 8,9; 211 L.H. (4). Mr. Soto

Equivalent: Spanish 1a, or one year of high-school Spanish.

S2a. Modern Spanish.—Rapid reading; review of grammar; composition. M.T.W.T., 9; 218 L.H. (2). Assistant Professor Van Horne

Note: Students who have had Spanish S2a in a previous Summer Session with different reading will be admitted to this course for full credit, but must do additional work outside the class.

Prerequisite: One year of college Spanish or the consent of the instructor.

Equivalent: Spanish 2a (in part).

S6a. Spanish Elementary Conversation.—T.T., 10; 211 L.H. (1). Mr. Soto

Prerequisite: One year of college Spanish or the consent of the instructor.

S25. Methods of Teaching Spanish.—The teacher's preparation, problems of instruction, phonetics. M.W., 10; 218 L.H. (1). Assistant Professor Van Horne

Courses for Graduates

A cycle of four courses, dealing with Spanish drama and prose of the seventeenth and nineteenth centuries, will be given in four successive summer sessions.

S123. Nineteenth Century Spanish Drama.—Lectures and readings. M.T.W.T., 11; 216 L.H. (1 unit). Assistant Professor Van Horne

Prerequisite: Three years of college Spanish or the consent of the instructor.

SOCIOLOGY

Assistant Professor SUTHERLAND, Mr. RATCLIFFE

Course for Undergraduates

S1. The Principles of Sociology and Their Application to Present Problems.—Text: E. C. Hayes' *Introduction to the Study of Sociology* (Appleton Co.) M.T.W.T F.S., 8; 308 L.H. (3). Mr. RATCLIFFE

Prerequisite: Junior standing o equ valent.

Equivalent: Sociology 1.

Courses for Advanced Undergraduates and Graduates

S8. Charities.—Causes of dependence, development and character of modern philanthropic methods, study of typical charity case records, prevention of dependence. M.T.W.T.F., 8; 306 L.H. (3). Asisstant Professor SUTHERLAND

Prerequisite: Sociology 1, or consent of the instructor.

Equivalent: Sociology 8.

S14. Methods of Social Research.—Particular emphasis on the social survey; social statistics; case studies and life records. M.T.W.T.F., 9; 306 L.H. (3).Assistant Professor SUTHERLAND

Prerequisite: Sociology 1 or consent of instructor.

Equivalent: Sociology 14.

Note: Courses S8 and S14 meet five times per week. Sufficient work will be assigned to entitle the student to three hours credit.

TRANSPORTATION

(See also BUSINESS ORGANIZATION AND OPERATION, AND ECONOMICS)
Associate Professor WATKINS

Courses for Undergraduates

S1. Transportation System of the United States.—The development and economic problems of railway and other transportation in the United States. Text: Johnson and Van Metre's *Principles of Railroad Transportation.* M.T.W.T.F.S., 10; 204 Com. (3). Associate Professor WATKINS

Prerequisite: Economics 1 and junior standing.

Equivalent: Transportation 1.

ZOOLOGY

Professor WILLARD, Dr. KUDO, Mr. HARRAH

Courses for Undergraduates

S1. General Zoology.—Animal biology; principles of structure; function, interrelations, origin, and development of animal life; simpler and best-established generalizations in zoological theory. Recitations and lectures. M.T.W.T.F., 1; 228 N.H. Laboratory; M.T.W.T.F., 10, 11; 312 N.H. (5 or 4). If for 4 credit hours only, omit Friday classes. Professor WILLARD, Dr. KUDO, and Mr. HARRAH

Equivalent: Zoology 1, if for 5 hours credit.

S2. Vertebrate Zoology and Comparative Anatomy.—Classification of the Chordata; early stages of vertebrate embryology; structure of vertebrate tissue; anatomy of systems of organs considered in respect to their functions, ontogeny, and evolution in the vertebrate series; anatomical studies of types of Chordata. Recitations and lectures. M.T.W.T., 1; 330 N.H. Laboratory, M.T.W.T.F.S., 10, 11; 310 N.H. (5).

Professor Willard, Dr. Kudo, and Mr. Harrah

Prerequisite: Zoology 1.

Equivalent: Zoology 2.

S13. Introduction to Field Zoology.—Field work involving collection of common zoological materials and laboratory practise in methods of preserving, preparing, and demonstrating them for class use. Saturday morning; 310 N.H. or in the field. (1). Dr. Kudo

Prerequisite: An introductory course in biology.

Courses for Advanced Undergraduates and Graduates

S23. Study of Protozoa.—Morphology, development, and identification of Protozoa, both free-living and parasitic in fishes and invertebrates. Laboratory, and field work, review of literature, conferences. Hours to be arranged. 312 N.H. (2 to 5). Dr. Kudo

Prerequisite: Senior standing and one year in Zoology.

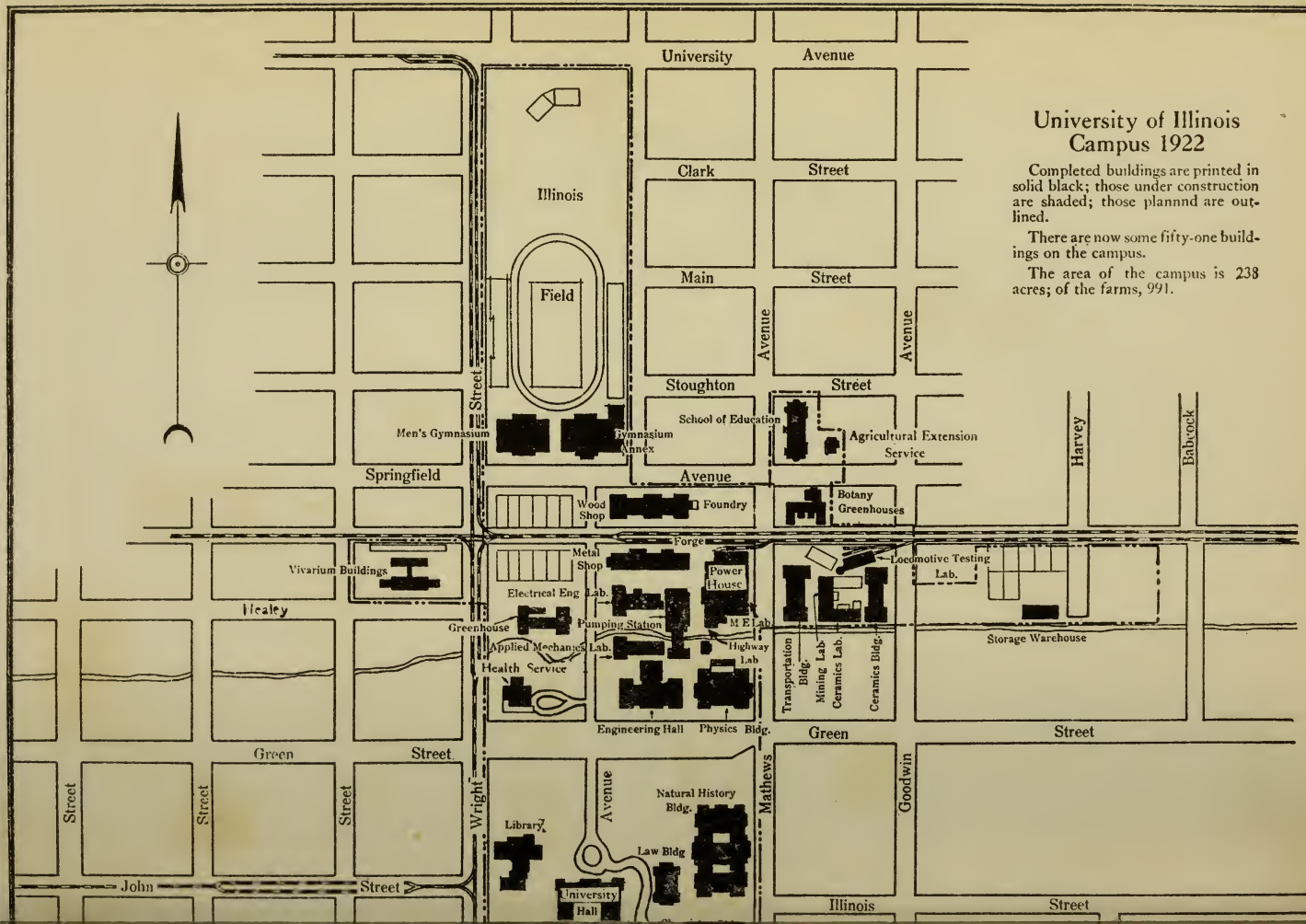
S31. Vertebrate Nervous System.—Principles of neuro-histology. Application of experimental and physiological data. More important fiber tracts considered in relation to the reflex mechanisms to which they belong, with especial reference to the mammals and man. Hours to be arranged. 310 N.H. (2). Professor Willard

Prerequisite: Zoology 1 and 2, or their equivalent.

Course for Graduates

S131. Minute Structure of the Nervous System.—Laboratory study of nervous tissue and the manner of its organization into nervous structures and sense organs. Demonstration and practise of some neuro-technical methods. Hours to be arranged. 326 N.H. (½ to 1 unit)

Professor Willard

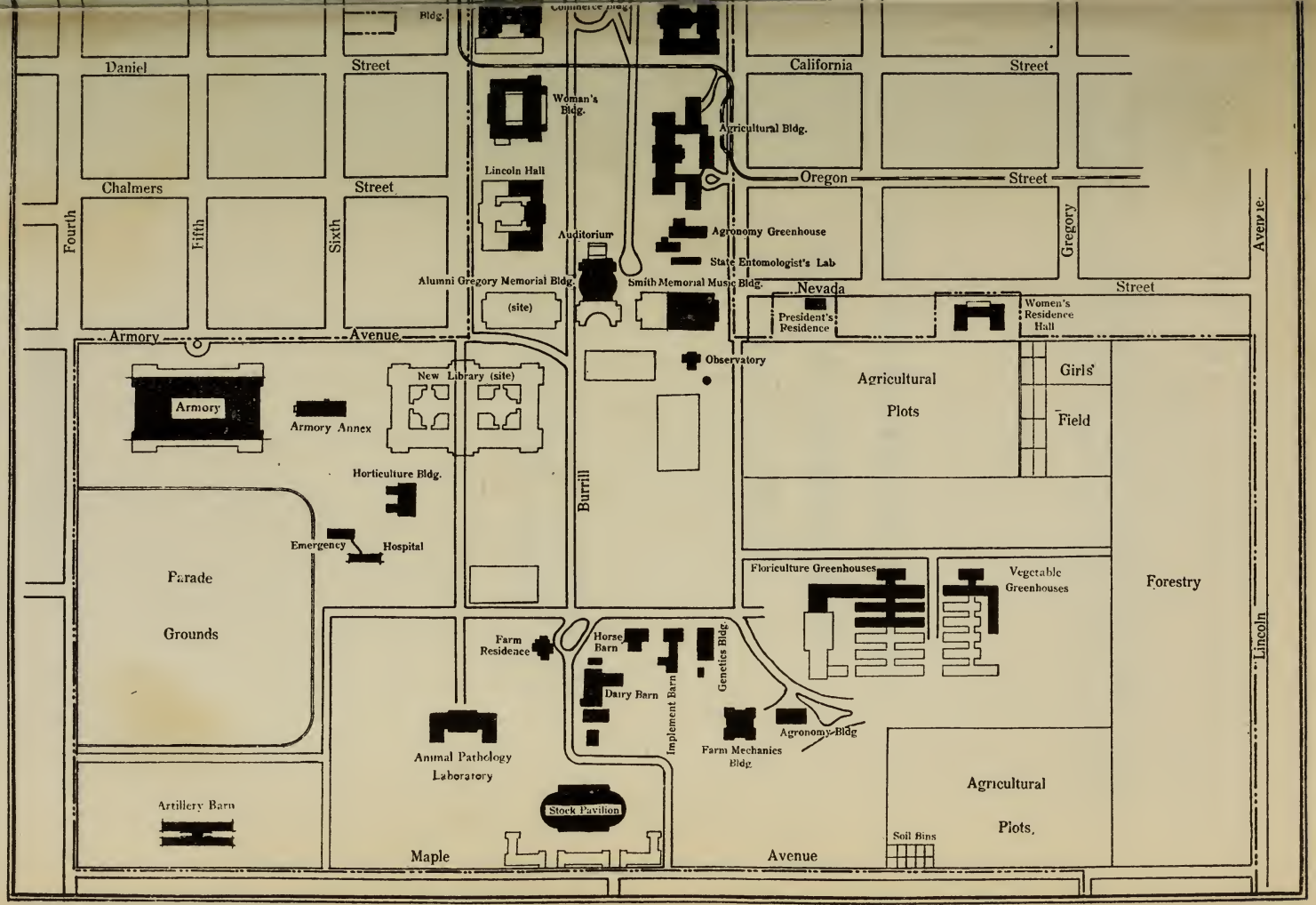


University of Illinois Campus 1922

Completed buildings are printed in solid black; those under construction are shaded; those plannnd are outlined.

There are now some fifty-one buildings on the campus.

The area of the campus is 238 acres; of the farms, 991.


Bldg.
Daniel
Street
California
Street
Woman's Bldg.
Agricultural Bldg.
Lincoln Hall
Chalmers
Street
Oregon
Street
Fourth
Fifth
Sixth
Auditorium
Agronomy Greenhouse
State Entomologist's Lab
Gregory
Avenue
Alumni Gregory Memorial Bldg.
(site)
Smith Memorial Music Bldg.
Nevada
Street
President's Residence
Women's Residence Hall
Armory
Avenue
Observatory
Armory
Armory Annex
New Library (site)
Agricultural Plots
Girls' Field
Horticulture Bldg.
Burrill
Emergency Hospital
Parade Grounds
Floriculture Greenhouses
Vegetable Greenhouses
Forestry
Farm Residence
Horse Barn
Genetics Bldg
Dairy Barn
Implement Barn
Agronomy Bldg
Farm Mechanics Bldg.
Animal Pathology Laboratory
Lincoln
Artillery Barn
Stock Pavilion
Agricultural Plots
Soil Bins
Maple
Avenue

UNIVERSITY OF ILLINOIS BULLETIN
VOL. XIX MARCH 13, 1922 No. 29
ISSUED WEEKLY
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The University of Illinois Summer Session, 1922

June 19 to August 12

GENERAL ANNOUNCEMENTS
FACULTY AND COURSES

URBANA, ILLINOIS

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UNIVERSITY OF ILLINOIS

Administrative Officers, Summer Session

DAVID KINLEY, PH.D., LL.D., President of the University.
CHARLES ERNEST CHADSEY, PH.D., Litt. D., Dean of the College of Education, *Director of the Summer Session, 203 University Hall*
GEORGE PHILLIP TUTTLE, B.S., Registrar, 156 Administration Building
HARRISON EDWARD CUNNINGHAM, A.B., Secretary of the Board of Trustees
LLOYD MOREY, A.B., B.Mus., C.P.A., Comptroller

Calendar

Summer Session, 1922

June 19, Monday—Registration Day
June 20, Tuesday, 8 a. m.—Instruction begun
June 22, Thursday—Assembly in Auditorium
June 27, Monday, 5 p. m.—Latest day for rebates in full
July 15, Saturday, 12 a. m.—Latest day for rebate of one-half fees
July 29, Saturday—End of Six Weeks' Courses
August 11 and 12, Friday and Saturday—Final Examinations

First Semester, 1922-1923

September 11-15, Monday to Friday—Entrance Examinations, Urbana and Chicago
September 18-19, Monday and Tuesday—Registration Days
September 18-23, Monday to Saturday—Examinations for Removal of Conditions, Chicago Professional Schools
September 20, Wednesday, 8 a. m.—Instruction Begun; 4 p. m.—Freshman Convocation
September 22-23, Friday and Saturday—Registration Begun, Chicago Professional Schools

Growth and Registration of Students in Summer Session and in Regular Session by Colleges and Schools

ALL DEPARTMENTS

College or School	1915	1916	1917	1918	1919	1920	1921
Summer Session	1028	1147	833	748	1314	1381	1976
L. A & S	1549	1784	1738	2239	2547	2535	2786
Commerce	581	739	606	1112	1588	1841	2063
Education	.....	.....	.....	.....	87	137	291
Engineering	1215	1213	916	1537	1768	1662	1737
Agriculture	1231	1173	657	722	1215	1135	1036
Music	86	108	113	111	119	117	101
Law	88	73	46	50	109	128	130
Library School	43	45	53	29	34	30	41
Graduate School	477	477	375	353	380	422	551
Total*	6427	6828	5590	7157	9249	9493	10627

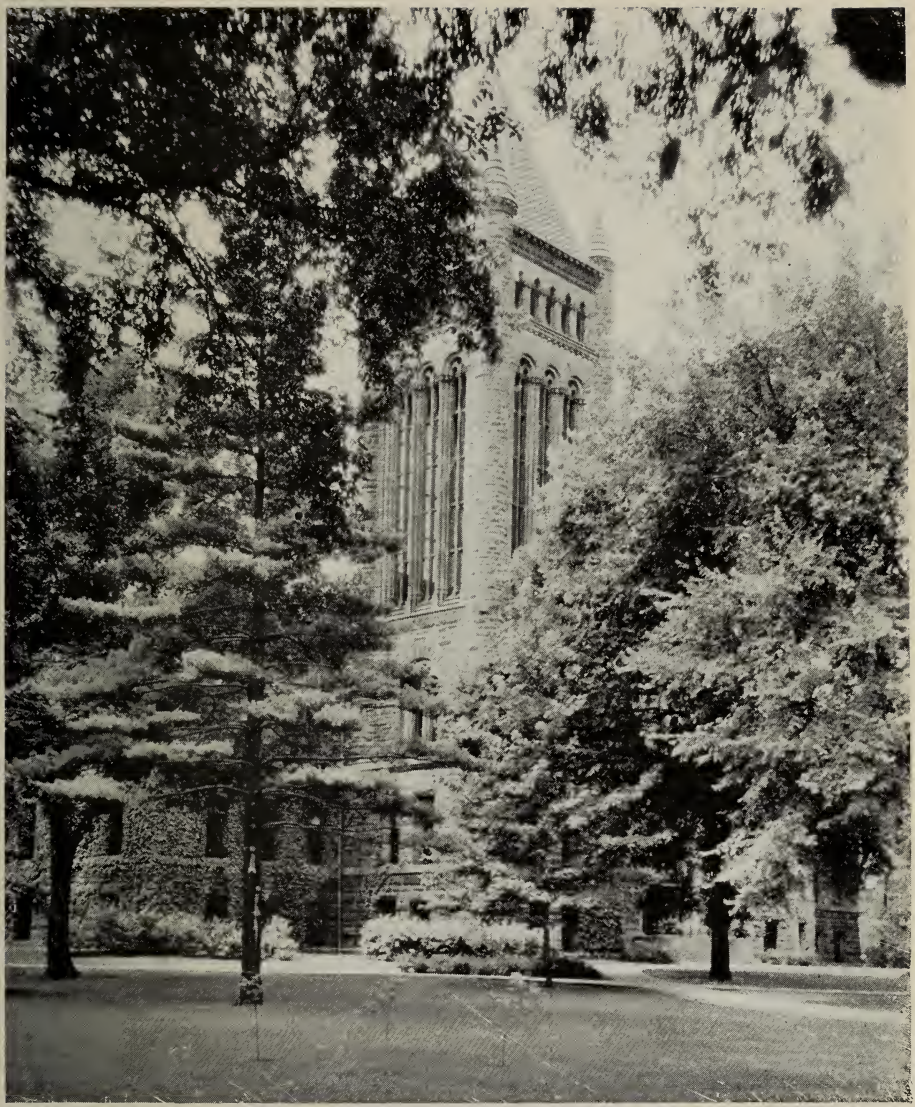
*Includes enrollment in Chicago Departments not itemized above.

OFFICERS OF INSTRUCTION

SUMMER SESSION, 1922

CHARLES ERNEST CHADSEY, PH.D., LITT.D., DIRECTOR

ADAMS, ROGER, PH.D., *Professor of Organic Chemistry*
ANDERSON, HARRIETT, A.B., *Assistant in Psychology*
ANDERSON, HARRY WARREN, PH.D., *Assistant Professor of Pomology*
ASHTON, BESSIE LEOLA, M.S., *Instructor in Geology*
BALDWIN, EDWARD CHAUNCEY, PH.D., *Assistant Professor of English Literature*
BARNES, OTIS AVERY, M.S., *Assistant in Chemistry*
BAUER, FREDERICK CHARLES, PH.D., *Associate Professor of Soils Extension*
BEAL, GEORGE DENTON, PH.D., PHARM. D., *Associate Professor of Chemistry*
BEARG, ERNEST ELMER, A.B., *Associate in Physical Education*
BELTING, PAUL EVERETTE, PH.D., *Assistant Professor of Secondary Education*
BENDER, HARRY ALBERT, A.M., *Assistant in Mathematics*
BERESFORD, ARTHUR, *Associate in Music*
BERG, HENRI JACOBUS VAN DEN, *Associate in Music*
BLANCHARD, WILLIAM OSCAR, PH.D., *Assistant Professor of Geology*
BOGART, ERNEST LUDLOW, PH.D., *Professor of Economics*
BOND, ETHEL, A.B., B.L.S., *Associate in Library Economics*
BOYD, ANNE MORRIS, A.B., B.L.S., *Associate in Library Economics*
BRADY, GEORGE KEYPERTS, A.M., *Instructor in English*
BRALEY, SILAS ALONZO, PH.D., *Assistant Professor of Chemistry*
BRAUCHER, HERBERT HILL, B.S., *Instructor in Industrial Education*
BREATHWIT, RACHEL A., A.M., *Assistant in Romance Languages*
BROWN, PEMBROKE HOLCOMB, A.M., *Instructor in Economics*
BROWN, WALTER STERRY, *Assistant in Physical Education*
BULLOCK, DAVID MADISON, *Assistant in Physical Education*
BUNDY, MURRAY WRIGHT, PH.D., *Instructor in English*
BUSSELL, NELLIE, *Instructor in Physical Education for Women*
CAMERON, EDWARD HERBERT, PH.D., *Professor of Educational Psychology*
CAMP, CHESTER CLAREMONT, PH.D., *Instructor in Mathematics*
CAMP, HAROLD LAVERN, PH.D., *Assistant High School Visitor*
CANTER, HOWARD VERNON, PH.D., *Professor of Classics, Assistant Dean, College of Liberal Arts and Sciences*
CARNAHAN, DAVID HOBART, PH.D., *Professor of Romance Languages*
CHADSEY, CHARLES ERNEST, PH.D., LITT. D., *Director of the Summer Session, Dean, College of Education, Professor of Education*
CLEAVINGER, JOHN SIMEON, A.B., B.L.S., *Assistant Professor of Library Economics*
CLIPPINGER, FRANK WARREN, A.M., *Assistant in English*
CRABB, DAVID WENDELL, A.B., *Assistant in Accountancy*
DALLERA, ITALIA, A.B., *Assistant in Romance Languages*
DAVIDSON, BLAINE THOMAS, LL.B., *Instructor in Business Law*
DODGE, DANIEL KILHAM, PH.D., *Professor of English Language and Literature*
DOLCH, EDWARD WILLIAM, A.M., *Instructor in English*
DOUGLAS, THEODORE WAYLAND, A.B., *Assistant in English*
EMCH, ARNOLD, PH.D., *Associate Professor of Mathematics*
ENGLIS, DUANE TAYLOR, PH.D., *Associate in Chemistry*
ENSIGN, NEWTON EDWARD, B. S., *Assistant Professor of Theoretical and Applied Mechanics*
FJELD, ERASTUS I., B.S., *Assistant in Accountancy*
FOLEY, MARGARET E., A.M., *Assistant in Romance Languages*
FREER, LOUISE, A.M., *Professor and Director of Physical Education for Women*
GARNER, JAMES WILFORD, PH.D., *Professor of Political Science*
GILL, HARRY LOVERING, *Associate in Physical Education*
GLASGOW, ROBERT DOUGLASS, PH.D., *Instructor in Entomology*
GOODENOUGH, GEORGE ALBERT, B. S., M. E., *Professor of Thermodynamics*



Library Tower

University Hall

Gottschalk, Lewis Reichenthal, Ph.D., *Instructor in History*
Graves, George Dewitt, M.S., *Graduate Assistant in Chemistry*
Green, Charles Francis, Ph.D., *Instructor in Mathematics*
Griffith, Coleman Roberts, Ph.D., *Associate in Psychology*
Griffith, John Lorenzo, A.B., *Assistant Professor of Physical Education*
Ham, Chester Raymond, A.B., *Instructor in Accountancy*
Ham, Lloyd Blinn, A.M., *Assistant in Physics*
Hamilton, Arthur, Ph.D., *Assistant Professor of Romance Languages*
Hayes, Edward Cary, Ph.D., LL.D., *Professor of Sociology*
Herrmann, Clarence Charles, B.S., *Assistant in Economics*
Higgins, George Marsh, Ph.D., *Professor of Biology, Knox College*
Hillebrand, Harold Newcomb, Ph.D., *Assistant Professor of English*
Hollister, Horace Adelbert, A.M., *Professor of Education*
Hopkins, B. Smith, Ph.D., *Associate Professor of Chemistry*
Hottes, Charles Frederick, Ph.D., *Professor of Plant Physiology*
Huff, George A., B.S., *Director of Physical Education for Men*
Hunt, Everett Lee, A.M., *Assistant Professor of English, Cornell University*
Hurd, Charles Dewitt, Ph.D., *Instructor in Chemistry*
Ingwersen, Burton Ahrens, B.S., *Associate in Physical Education*
Jensen, William Jacob, A.B., *Assistant in Physics*
Jones, Harry Stuart Vedder, Ph.D., *Associate Professor of English*
Johnson, Frank Tatham, *Associate in Music*
Junkin, Della Darle, M.S., *Assistant in Chemistry*
Kaufmann, W. E., A.B., *Graduate Assistant in Physiological Chemistry*
Kremers, Harry C., Ph.D., *Assistant Professor of Chemistry*
Krusé, Cornelius Francis, B.D., A.M., *Associate in Educational Psychology*
Lake, Edward John, B.S., *Assistant Professor of Art and Design*
Lehmann, Emil Wilhelm, E.E., A.E., *Professor of Farm Mechanics*
Lewis, Howard Bishop, Ph.D., *Associate Professor of Physiological Chemistry*
Littleton, Ananias Charles, A.M., C.P.A., *Assistant Professor of Accountancy, Assistant Dean of College of Commerce*
Lundgren, Carl Leonard, B.S., *Assistant Professor of Physical Education*
Lytle, Ernest Barnes, Ph.D., *Assistant Professor of Mathematics*
McClure, Matthew Thompson, Ph.D., *Associate Professor of Philosophy*
McClusky, Frederick Dean, A.M., *Instructor in Educational Psychology*
McDougall, Walter Byron, Ph.D., *Assistant Professor of Botany*
McIntyre, Robson Duncan, B.S., *Assistant in Business Organization and Operation*
Marvel, Carl Shipp, Ph.D., *Associate in Chemistry*
Matthews, Jim P., A.B., *Assistant in Library Science*
Metcalf, Clell Lee, D.Sc., *Professor of Entomology*
Miller, E. J., A.B., *Assistant in Economics*
Miller, George Abram, Ph.D., *Professor of Mathematics*
Monroe, Walter Scott, Ph.D., *Professor of Education, Director, Bureau of Educational Research*
Nelson, Severina Elaine, A.B., *Assistant in English*
Nolan, Aretas Wilbur, M.S., *Associate Professor of Agriculture and Director of Teaching Training in Vocational Agriculture*
Oldfather, William Abbott, Ph.D., *Professor of Classics*
Phillips, D. E., Ph.D., *Professor of Education, University of Denver*
Phillips, Mary Dodds, *Instructor in Music*
Pieper, John, M S., *Associate in Crop Production*
Pleasants, Annie Lewis, A.B., *Assistant in Botany*
Putnam, William James, M. S., *Assistant Professor of Theoretical and Applied Mechanics*
Ratcliffe, Samuel Caleb, Ph.D., *Instructor in Sociology*
Ramsdell, Charles William, Ph.D., *Professor of History, University of Texas*
Rice, Warner G., A.B., *Assistant in English*
Roberts, Ashbell Seliew, A.M., *Instructor in History*
Roberts, Elmer, Ph.D., *Assistant Professor of Genetics*
Roosbroeck, Gustav L. van, Ph.D., *Assistant Professor of Romance Languages, University of Minnesota*

Sanders, William Howard, A.B., *Assistant in Physics*
Schlatter, Charles F., B.S., *Instructor in Accountancy*
Schlaudt, Carl, A.B., *Assistant in German*
Scovill, Hiram Thompson, A.B., C.P.A., *Professor of Accountancy*
Secord, Arthur Wellesley, A.M., *Assistant in English*
Seely, Fred B., M. S., *Professor of Theoretical and Applied Mechanics*
Seybolt, Robert Francis, Ph.D., *Associate Professor of History of Education*
Shaw, James Byrnie, D.Sc., *Professor of Mathematics*
Shoup, Emma Mae, B.S., *Assistant in Library Science*
Soto, Rafael Arcangel, A.M., *Associate Professor of Romance Languages, University of North Dakota*
Souther, Benjamin Leslie, Ph.D., *Instructor in Chemistry*
Staley, Seward C., *Associate in Physical Education*
Stiven, Frederic Benjamin, B.Mus., A.A.G.O., *Professor of Music, Director, School of Music*
Storer, Walter Henry, A.M., *Assistant in Romance Languages*
Tanner, Fred Wilbur, Ph.D., *Associate Professor of Bacteriology*
Taylor, Paul Canaday, B.S., *Assistant in Accountancy*
Terborgh, Martha Rose, A.B., *Instructor in Physical Education for Women, Knox College*
Thompson, Luther S., A.B., *Assistant in Bacteriology*
Tolman, Robert Gardner, B.S., *Assistant in Business Organization and Operation*
Treat, Edna A., B.Mus., *Instructor in Music*
Tschudi, Erwin William, A.M., *Assistant in Mathematics*
Uhlendorf, Bernhard A., Ph.D., *Instructor in German*
Van Cleave, Harley Jones, Ph.D., *Assistant Professor of Zoology*
Wagner, Carlos John, *Instructor in Physical Education*
Walther, Albertine, A.M., *Assistant in Romance Languages*
Watson, Floyd Rowe, Ph.D., *Professor of Experimental Physics*
Watt, Russell A., B.S., *Instructor in General Engineering Drawing*
Weber, Oscar F., A.B., *Assistant in German*
Weinard, Frederick Francis, A.M., *Assistant in Botany*
Westergaard, Harald Malcolm, Ph.D., *Assistant Professor of Theoretical and Applied Mechanics*
Whitcomb, Adah Frances, *Associate in Library Science*
Williams, Charles Allyn, Ph.D., *Assistant Professor of German*
Williams, Elmer Howard, Ph.D., *Assistant Professor of Experimental Physics*
Williams, Lewis Ward, A.M., *Instructor in Education*; *Principal, University High School*; *Secretary, Appointments Committee*
Winters, Frank J., B.P.E., *Associate in Physical Education*
Zuppke, Robert Carl, Ph.B., *Professor of Physical Education*

GENERAL INFORMATION

Location of the University of Illinois

The University of Illinois is situated in Champaign County about fifty miles northeast of the geographical center of the State. It is 126 miles south of Chicago, 118 miles west of Indianapolis and 164 miles northeast of St. Louis. The campus of the University lies between the cities of Urbana and Champaign and within the corporate limits of the former. Urbana and Champaign, with a population of 29,000, are in the heart of the "Corn Belt" and form the business and social center of a rich farming community. The University is connected with neighboring cities in Illinois, including Bloomington, Danville, Decatur, Peoria and Springfield, and also with St. Louis, by the electric interurban lines of the Illinois Traction System. Champaign may be reached from Chicago and the north and from points in the south by the Illinois Central Railroad. The Wabash and the "Big Four" have stations in both cities.

Buildings and Grounds

The land occupied by the University embraces 238 acres, besides a farm of 991 acres. There are at the present time some fifty-three buildings on the campus.

Libraries

The University library, at Urbana, contains 470,000 volumes, and receives over 3,500 periodicals; the current numbers of many of these periodicals are kept in the public reading room. The library of the State Laboratory of Natural History contains 10,500 volumes and 54,000 pamphlets.

The library is housed, for the most part, in the Library building, and is for the use of the whole University. All students have the direct use of 10,700 volumes in the reading rooms, and in addition graduate and advanced undergraduate students have the use of the departmental libraries. Twenty-one seminar and departmental collections are maintained in various buildings on the campus: six of these contain over 20,000 volumes each, and all have convenient facilities for study.

Museums

A number of museums containing collections of varied interest are housed in different buildings on the campus. These collections include art works, archeological remains and objects showing the development of Oriental and European culture. The departmental scientific laboratories make provision for research, instruction in drill-courses and demonstrations in the lecture-room. The herbarium of the Department of Botany contains over 100,000 sheets of mounted specimens. The Entomology collections include a reference series of 6,400 specimens. The Department of Geology has adequate working collections, including exhibits of gems and precious stones. The Geography and Zoology exhibits are to be found in the Natural History Building. For its courses in industrial economics and commerce the University has a collection of the materials of commerce. The Colleges of Engineering, Education, Agriculture, and the Library School also maintain exhibits.

The Summer Session

The Summer Session of the University of Illinois for 1922 will open on June 19 and close on August 12, making a term of *eight weeks* or one-half a semester, except for students taking courses in physical education for men, or athletic coaching and certain elementary courses in Library Science, for whom the term is *six weeks* from June 19. The opening day will be devoted to registration. The final examinations will be held on Friday and Saturday of the last week.

All of the courses, except those mentioned above, will extend through the eight weeks. Students who wish to remain the six weeks only, however, may obtain from the Director of the Summer Session a certificate for such attendance, but university credit will not be given for six-weeks' courses, except for those in physical education for men and in athletic coaching.

The number of semester hours' credit which may be earned in each course is stated in the descriptive outline given later in this announcement. Students may register for courses aggregating eight hours or less.

Purpose

The Summer Session is an organized integral part of the University year. Though its organization is not subdivided into colleges, numerous courses are offered by departments in the Colleges of Liberal Arts and Sciences, Commerce, Agriculture, Engineering, Education, and in the School of Music and the Library School. All courses may be counted toward either an A.B., B.S. or B.L.S. degree, or toward a master's degree, unless otherwise specified. By attending two Summer Sessions a regular student may secure his degree a half year earlier than he otherwise can.

Students who have just graduated from an accredited high school may matriculate in the Summer Session and obtain credit for a half-semester. Pre-medical students are strongly urged to do this and to register for chemistry or zoology, mathematics, rhetoric, or other prescribed pre-medical subjects.

One of the primary purposes of the Summer Session is to meet the needs of the teachers in the public schools, who wish to spend a part of the summer vacation in serious study or investigation. Numerous courses are designed particularly for high-school teachers, supervising officers, teachers of special subjects (agriculture, art, manual training, music, industrial education, etc.), librarians and coaches of athletic teams; graduate courses are offered for college instructors, school supervisors, and principals who are working for advanced degrees.

Admission

Admission in regular status to courses in the Summer Session for which university credit is granted is limited to students who could be regularly admitted into the colleges of the University (Liberal Arts and Sciences, or Commerce, or Engineering, or Agriculture, or Education, or Library School) in which they would be registered in the winter session.

In order to meet in full the entrance requirements for any one of these undergraduate colleges, a student must be a graduate of an accredited high school (or in lieu of such graduation, must pass entrance examinations in five units, including English composition, 1; algebra, 1; and three others to be designated by the University authorities in each case), and must obtain credit, either by passing entrance examinations or by presenting certificates of work completed in accredited secondary schools or other recognized schools, for 15 units of high-school work, or the equivalent, in subjects accepted for admission to the University, including in the case of each college certain subjects especially prescribed for admission to that college.

Admission to courses which give university credit, as *special students, not candidates for a degree*, may be granted to persons 21 years of age or over, subject to the general regulations of the University relating to special students.

(1) The subjects prescribed for admission to the *College of Liberal Arts and Sciences* for the *General Curriculum*, the *Curriculum in Journalism*, and the *Pre-Legal Curriculum*, are: English, 3 units; algebra, 1 unit; plane geometry, 1 unit; laboratory science, 1 unit; Latin, Greek, French, German, or Spanish, 2 units (both units in the same language). Seven elective units are required to make up the total of 15 units.

(2) For the *College of Liberal Arts and Sciences*, for the curriculums in *Household Administration* and for *Household Science Teachers*, the prescriptions are the same as in paragraph 1, except that the laboratory science, 1 unit must be physics. (See also paragraph 7.)

(3) For the *College of Liberal Arts and Sciences*, for the *Pre-Medical Curriculum*, the prescribed subjects are English, 3 units; algebra, 1 unit; plane geometry, 1 unit; laboratory science, 1 unit; Latin, Greek, French, or German, 2 units (both units in the same language); history or civics, 1 unit. Six elective units are required to make up the total of 15 units.

(4) For the *College of Liberal Arts and Sciences*, for the curriculums in *Chemistry* and *Chemical Engineering* the prescribed subjects are: English, 3 units; algebra, 1 unit; plane geometry, 1 unit; laboratory science, 2 units, German or French, 2 units (both units in the same language). Six elective units are required to make up the total of 15 units.

(5) For the *College of Engineering*, the prescribed subjects are: English, 3 units; algebra, 1½ units; plane geometry, 1 unit; solid and spherical geometry, ½ unit; laboratory science, 1 unit. Eight elective units are required to make up the total of 15 units.

(6) For the *College of Agriculture*, for the *agricultural curriculums*, the prescribed subjects are: English, 3 units; algebra, 1 unit; plane geometry, 1 unit; laboratory science, 2 units. Eight elective units are required to make up the total of 15 units.

(7) For the *College of Agriculture*, for the curriculum in *Household Science*, the prescribed subjects are the same as in paragraph 6 except that one of the units of laboratory science must be physics.

(8) Students who can meet the prescriptions for any of the other colleges as outlined above may be admitted to the *College of Commerce and Business Administration.*

(9) For the *College of Education*, sixty hours of university credit except for the curriculums in *Athletic Coaching and Industrial Education*, in which the prescribed subjects are the same as in paragraph 1 or 2.

(10) Admission to the eight-weeks courses in the *Library School* is conditioned on the completion of four years of college work in the Liberal Arts and Sciences.

A student who transfers from another college or university must present a letter of honorable dismissal, and transcript of record, from the institution previously attended.

Registration

Students will present themselves for registration on Monday, June 19. *The registration offices will be in the Library Building.* A representative of each department offering Summer Session courses will be present throughout the day. Students will consult with these representatives regarding the courses for which they wish to register. The study blanks will then be filled out, submitted to the Director for approval, and filed with the Registrar.

Students who wish to register for advanced degrees will first secure their study-lists at the Registrar's office, 156 Administration Building.

Fees

All fees are due upon registration.

An incidental fee of twenty dollars ($20) is required of all residents of Illinois in regular attendance at the Session and of thirty dollars ($30) for students not residing in the State. This entitles one to admission to regular courses and to all special lectures. An extra laboratory fee is charged in some courses for materials used. Any single course, counting not more than two and one-half credit hours, may be taken by Illinois students for a fee of ten dollars ($10), fifteen dollars ($15) by students not residing in the State, and the laboratory fee, if there be any in connection with the course taken.

In addition to the above general fees students registering in courses in applied music (voice, piano, violin, violoncello, organ, or band instruments) pay special music fees as follows:

For one lesson a week	$3.00
For two lessons a week	5.00
Piano for practise one hour a day for the Session	1.50

Additional hours at the same rate.

Organ for practise one hour a day for the Session	10.00

By a ruling of the Board of Trustees of the University, all high school teachers in Illinois, and all other teachers in the State who are qualified to matriculate in the University as regular students, are entitled to Summer Session scholarships of twelve dollars ($12), reducing for them the incidental fee from twenty dollars ($20) to eight dollars ($8). To matriculate regularly in the University, one must satisfy in full entrance requirements for some one of the colleges as outlined on page 10.

By a more recent resolution of the Board of Trustees, the scholarship privilege of twelve dollars ($12) reduction of fees is extended to graduates of the Illinois State normal schools, class of 1922, and to persons (otherwise qualified) who have not been teachers the past year but who are under contract to teach in the State during the coming year.

By action of the Board of Trustees, librarians and library assistants in Illinois libraries and persons under contract to serve in such positions, and who can matriculate in the University, shall be entitled to a scholarship of twelve dollars ($12) which reduces the incidental fee for them from twenty dollars ($20) to eight dollars ($8).

A person who wishes to take advantage of the scholarship privilege must present to the Registrar prior to June 1, 1922, a statement from the board of education employing him, to the effect that he has either been teaching during the past year or is under contract to teach during the coming year. A normal school graduate (class of 1922) must present either a diploma or a written statement from the president of the normal school certifying that he is a graduate of this year's class.

Application blanks for scholarships may be obtained by addressing the Registrar.

The Bachelor's Degree

All the undergraduate work offered in the Summer Session carries regular university credit which may be counted, unless otherwise specified, towards the degree of Bachelor of Arts or Bachelor of Science. By careful selection of courses the graduation requirements of the College of Liberal Arts and Sciences may be met in large part by Summer Session work. In the Colleges of Engineering and Agriculture the non-technical requirements and a part of the technical engineering or agricultural requirements may be covered in the Summer Session. For the detailed requirements of the several colleges the student should consult the Annual Register of the University under the head of the college in which he is interested. *A student who is definitely a candidate for a degree* should also check over the work he has had and plan his future course in consultation with the dean or assistant dean of the college of his choice—

For the College of Liberal Arts and Sciences—Dean Babcock, Room 304, University Hall.

For the College of Commerce and Business Administration—Dean Thompson, Room 104, Commerce Building.

For the College of Engineering—Assistant Dean Jordan, Room 300, Engineering Hall.

For the College of Agriculture—Assistant Dean Rankin, Room 100, Agriculture Building.

For the College of Education—Dean Chadsey, Room 203, University Hall.

For the Library School—Director P. L. Windsor, 316 Library Building.

General Assembly in Auditorium

On the first Thursday of the Session, June 22, at 4 p.m., an Assembly will be held. All students and members of the instructional staff are requested to attend. At this time general announcement will be made, concerning lectures, entertainments, and other non-academic activities.

Preparation for Illinois State Teachers' Certificates

To teachers who desire to make thorough preparation for the state-certificate examinations, the Summer Session offers marked advantages, especially in connection with the professional subjects.

Among the provisions of the certificating law, enacted by the General Assembly of Illinois in 1913, are the following examination requirements for the various kinds of certificates:

1. Four-year elementary-school certificate: Examination in English, educational psychology, and principles and methods of teaching.
2. Four-year high-school certificate: Examination in English, educational psychology, and principles and methods of teaching.
3. Four-year supervisory certificate: Requirements are the same as for the elementary-school certificate, except that the examination includes, in addition, sociology, history of education, and school organization, administration, and supervision.

County Certificate

1. Second-grade elementary-school certificate: Examination in common branches, pedagogy, elementary science.
2. First-grade elementary-school certificate: Examination in the common branches, three of the natural sciences; English, algebra, general history, and pedagogy.
3. High-school certificate: Examination in English, pedagogy, and six high-school subjects.
4. Supervisory certificate: Examination in English, educational psychology, history of education, and school administration.
5. Special certificate: Examination in English and principles and methods of teaching.

Examinations for the *State Elementary-School Certificate*, the *State Supervisory Certificate*, and the *State High-School Certificate* will be held at the University in July, *provided that at least fifteen applicants notify the State Superintendent prior to June* 10, 1922, *of their wish to take the examination here.*

The following excerpt from Circular No. 72 of the office of the State Superintendent of Public Instruction describes the new method of preparing theses:

"A thesis prepared under the direction of a teacher in a normal school, college or university either in residence or by correspondence, and accompanied by a statement from such teacher as to the method and spirit of study, the originality and thoroughness shown by the candidate in such preparation and an estimate of the thesis, will be accepted. Candidates who cannot prepare a thesis under these conditions will be given three hours at the examination to write upon the subject selected."

The instructors at the University will be glad to direct the preparation of theses to be submitted to meet the above requirements.

The following Summer Session courses are especially adapted to prepare for the professional examinations:

Education S10: Technic of Teaching.

Education S23, S28, and S60 will be valuable for those preparing theses for the State Supervisory Certificate.

Education S2: History of Education. (The applicant for the State Supervisory Certificate must pass an examination in the history of education.)

Education S25: Educational Psychology.

Education S6: The Principles of Secondary Education.

Attention is also called to the various courses in English and rhetoric in connection with the English requirements for all certificates.

Graduate Work in the Summer Session

In recent summer sessions the University has placed increasing emphasis on graduate courses leading to the master's degree. The departments which are closely related to high-school teaching and to educational adminstration have been selected as the centers of this emphasis. An attempt is made to vary the graduate offerings from year to year so that advanced students who attend the University summer after summer may continue to find acceptable work in their chosen fields.

Graduate students in the Summer Session are subject to the same scholastic requirements as those in the regular University year. *Their study list must be approved by the Dean of the Graduate School, or his representative*, in 109 Commerce Building. Attendance on four summer sessions, or one semester and two summer sessions, is considered the equivalent of one year in residence. If in these sessions the required amount of work is properly done a master's degree may be earned in this way.

No course offered in the Summer Session may be taken for credit towards a higher degree unless it is specially described in the Summer Session circular as accepted for that purpose.

In certain cases it is possible for a graduate student to complete the thesis requirements for the master's degree to the extent of the last fourth of the total requirement for the degree under a leave of absence. This privilege may be granted in the event that the student is able to take advantage of opportunities for research and investigation that are not afforded in the University community. Superintendents, principals, and class-room teachers frequently find it possible to carry on investigation in connection with their school work. There are, for example, numerous problems of school administration and of teaching for which the public school itself forms the only available "laboratory." Where the investigation of such problems is prosecuted under the direction of a university department, it may be possible, on individual petition beforehand, to count the work toward the master's degree.

Students working for their masters' degrees in the Summer Session must announce their thesis subjects not later than the beginning of their third session in residence.

Graduate courses in medical sciences are offered in the summer quarter between June and September at the College of Medicine of the University of Illinois in Chicago. Circulars describing the courses offered and conditions of admission and work may be obtained from the Secretary of the University of Illinois College of Medicine, Congress and Honore Streets, Chicago.

For further information about advanced degrees and the regulations therefor, the Graduate School circular should be consulted.

Courses in Library Science

Courses for the training of librarians have been offered since the summer of 1911, and two distinct groups of courses will be offered in 1922.

(1) For College graduates, with or without library experience, there are offered eight-weeks courses selected from the two-year curriculum of the Library School, counting toward the B. L. S. degree. A student completing the courses offered in

1921, and also those to be given in 1922, will have completed the first semester's work in the Library School.

(2) For high school graduates who are employed as librarians or library assistants, and for certain others who have completed one full year of study in a college or normal school, six-weeks courses are offered which are more elementary and not counted toward the B.L.S. degree. Problems confronting Illinois libraries will be given special consideration in these six-weeks courses, and until May 1, only applicants from Illinois will be accepted for admission. After that date those from other states will be admitted, if there is room.

Application blanks for admission must be secured, and these should be filled out and sent to the Director of the School together with such additional statements as the candidate may offer, showing his qualifications for admission. The application must be filed sufficiently early to enable the School to receive replies from librarians and others who have personal knowledge of the applicant.

For further information than that contained in the description of courses, (pages 31, and 32), address the Director of the University of Illinois Library School, Urbana, Illinois.

Teachers' Conferences

The informal features of the Session will include a continuation of the Conference of Teachers, Superintendents, and Principals. The importance of these round-table discussions, supplementing the more formal class exercises, has been amply demonstrated by the experience in other sessions. Members of the staff of the College of Education will organize and conduct these conferences.

Teachers' conferences have also been arranged for by the Departments of Agricultural Education, Education, English, Mathematics, Physics and Romance Languages.

Courses for Athletic Coaches

Courses for Athletic Coaches were established in connection with the Summer Session of 1914, under the general direction of George A. Huff, Director of Physical Education for Men, to meet the growing demand, not only from high schools, but from colleges and other institutions as well, for trained men to direct and coach athletics. They were designed to assist both the high-school teacher or principal who desired to become proficient in coaching one or more athletic teams and the man who intended to take up the directing of athletics or coaching as a vocation.

The courses will again be a feature of the Summer Session, occupying the first six weeks. All the courses will be taught by the men who coach the athletic teams of the University of Illinois: in baseball (Director Huff and Assistant Professor Carl L. Lundgren), track athletics (Mr. Harry L. Gill), basketball (Mr. Frank J. Winters), gymnastics (Mr. Seward C. Staley), football (Professor Robert C. Zuppke), and group games and mass athletics (Assistant Professor John L. Griffith). The athletic plant of the University is turned into a laboratory and the larger part of the instruction is given on Illinois Field.

Students may devote either their whole time, or part of their time to these courses. Detailed information regarding the courses for Athletic Coaches may be found in a special circular which will be sent on application to Director George A. Huff, Gymnasium, Urbana, Illinois.

Board and Lodging

The fact that the larger part of the usual University community will be away at the time of the Summer Session will make lodgings and boarding accommodations plentiful. The Young Men's and Young Women's Christian Associations of the University will prepare a list of boarding places which can be recommended, and they will aid students in securing desirable locations.

Board may be obtained at from $6.00 to $7.50 a week.

Double rooms near the University, if occupied by two persons, may be had at from $8.00 to $12.00 a month.

The Woman's Residence Hall is located on Nevada Street, north of and adjacent to the athletic field for women. There are both double and single rooms, the basement containing a large dining room in each wing overlooking the sunken garden in the court. In the center of the first floor is a large living room with adjoining parlors. At the south end of each wing on each floor is a commodious sleeping porch. Women students occupying single rooms may obtain room and board at the Residence Hall for $80, covering the eight-weeks Summer Session; for those occupying double rooms

Lincoln Hall

Auditorium

the charge is $70. Applications for rooms should be addressed to the Dean of Women, Woman's Building.

The Illinois Union Building, formerly the Young Men's Christian Association Building, has accommodations for ninety-one men students, and is under University supervision. There are shower baths on each floor. Fourteen of the rooms have lavatories and six have private baths. The rooms are adequately furnished. The price of the rooms for the entire summer session ranges from $22.00 for a one-man room to $60.00 for a three-man suite with bath. The Illinois Union Cafeteria is located in the basement of the building. There is a barber shop and tailor shop also in the basement. The Illinois Union club rooms are located on the first floor. The building is situated at the corner of John and Wright Streets, immediately adjacent to the campus.

Applications for or inquiries regarding rooms should be addressed to the Illinois Union Building.

Summer Session Band

Professor Albert A. Harding, Director of the University of Illinois Bands, will form a band for Summer Session students. Those who have heard the University of Illinois Concert Band on tour will appreciate the quality of training given at the University. Candidates should bring their instruments with them, as the University only furnishes large instruments and those of an unusual character. Tryouts will be held during the first week of the Session and application blanks may be secured at the Band Office, 217 University Hall. Rehearsals will be held twice a week with an extra session to give prospective leaders special instruction in methods of band organization and conducting. Time for individual consultation and coaching should also be allowed. After a few weeks of rehearsal the Summer Session Band will give informal campus concerts one evening a week.

Those desiring to gain experience in conducting musical organizations are thus afforded opportunity for instruction and laboratory practise.

Instruction in Horsemanship

Students and members of the faculty may enroll for horseback riding. Previous experience is unnecessary as all who register will be given supervision until they can ride alone. All students who are qualified may ride alone, or receive instruction if they prefer. The preliminary instruction will be given at 8 a. m. and 3 p. m. on Monday, Tuesday, Thursday, and Friday. Students unable to attend at these hours may arrange their instruction at the Military stables.

EQUIPMENT: Students should provide themselves with suitable clothing. Horses, saddled and bridled, will be provided at the Military stables. Students should arrange a day in advance for the time they wish their horses ready, by telephoning the Military stables, Main 4532. Special attention will be given to providing gentle and trained horses.

FEES: A fee of $12.50 is charged, which entitles the student to ride 16 hours.

REGISTRATION: Registration is accomplished at the Business Office by payment of the fee, after which appointments for instruction should be arranged at the Military stables. Picnics and excursions on horseback will be arranged during the course.

INSTRUCTOR: Assistant Professor Chauncey A. Bennett, Captain Field Artillery, United States Army.

Lectures, Receptions, Entertainments, Athletics

In addition to the regular class work, the Summer Session provides a number of incidental exercises which give an atmosphere differing but little from that of the other sessions of the year: receptions given to students; entertainments, debates, teachers' conferences, and clubs arranged by the students themselves; games and athletic contests: dramatics, exhibits of folk and interpretive dancing, band concerts; and the general lectures given by members of the University Departments and by men from other institutions.

The song services will be continued under the direction of Director Frederic B. Stiven of the School of Music. All students and faculty members are cordially invited to take part in the singing on the Auditorium steps Wednesday evenings at 7:00.

Director Stiven will give a series of organ recitals during the Session.

Although both the men's and women's gymnasiums will be used in some parts of the regular class work in Physical Education, they are nevertheless open to students not registered in those courses, for the purpose of general recreation and exercise. Both of the gymnasiums contain swimming pools, shower baths, lockers, and dressing rooms. Students are charged a small sum for a locker. The tennis courts, general athletic fields, and golf course on the University campus are open to the student body.

Information

For further information on any matter connected with the Summer Session, address the Registrar of the University, or

CHARLES ERNEST CHADSEY,
DIRECTOR OF THE SUMMER SESSION,
203 University Hall,
Urbana, Illinois.

DESCRIPTION OF COURSES

Explanation

The arrangement of subjects in the following description of courses is alphabetical. The connections of allied departments are indicated by cross references.

"S" (summer) which is prefixed to each of the courses offered is the sign used to distinguish the Summer Session courses from those having the same number offered during the regular University year. Following the description of each course will be found a statement of requirements for admission to that particular course and a statement of the equivalency of credit for such course as related to the course given in other sessions of the University. For example, the prerequisite for Mathematics 9 is Mathematics 7. This means that Mathematics 7 must be completed before Mathematics 9 may be taken. Since the Summer Session courses do not invariably cover the same ground as courses similarly numbered in the regular sessions of the University, the equivalency is sometimes noted as partial rather than full.

If a course not required for graduation is selected by fewer than five students, it may be withdrawn.

Graduate courses are numbered upwards from 100. Such courses are open only to graduate students.

Credit is reckoned for the undergraduate students in *semester hours* or simply *hours*. An *hour* represents one classroom period a week for one semester requiring 2 hours preparation on the part of the student, or three hours in laboratory, shop, or drawing room. The number of credit hours for which each course counts is shown after each course by the figure in parenthesis, for example, Education S25. (3).

The following abbreviations are used to designate the different buildings used during the Summer Session.

Agriculture Building	Agr.
Applied Mechanics Laboratory	L. A. M.
Astronomical Observatory	Obs.
Ceramics Laboratory	Cer.
Chemistry Building	Chem.
Commerce Building	Com.
Electrical Engineering Laboratory	E. E. L.
Engineering Hall	E. H.
Farm Mechanics Building	F. M.
Floricultural Greenhouses	F. G.
Genetics Building	Gen.
Horticultural Building	H. B.
Library	Lib.
Lincoln Hall	L. H.
Mechanical Engineering Laboratory	M. L.
Men's Gymnasium	Gym.
Metal Shops	M. S.
Mining Engineering Laboratory	Min. L
Natural History Hall	N. H.
Physics Laboratory	P. L.
Smith Memorial Hall	S. M. H
Stock Judging Pavilion	S. P.
Transportation Building	T. B.
University Hall	U. H.
University High School	U. H. S.
Vegetable Greenhouse	V. G.
Vivarium Building	V. B.
Woman's Building	W. B.
Wood Shops	W. S.

ACCOUNTANCY

(See Business Organization and Operation)

AGRICULTURE AND AGRICULTURAL EDUCATION

Associate Professor Nolan

S1. General Agriculture.—An introductory survey course, treating of such major phases and problems of agriculture as every teacher and citizen should know and appreciate. MTW, 8; Th, 8-9; 122 Agr. (2).

S50D. Project Supervision.—Farm practise supervision and summer teaching in vocational agriculture. The farm projects of vocational students in the Twin City high schools will be the basis for conferences and visitations in this course. WF, 1; 122 Agr. (3).

Each University student in the course will be assigned to two or three vocational students to visit once each week. (Arrange time.) Required of all vocational teachers.

S51. Teacher's course in Agricultural Education.—Principles and methods in teaching vocational agriculture. MTWTF, 10; 455 Agr. (2½).

Associate Professor Nolan

Prerequisite: Junior or senior standing. Required of Vocational Teachers.

S90. Rural Education.—A study of rural life conditions, needs, standards, and agencies for improvement. The place of agriculture, the rural school, the church and farm organizations, in programs of rural community development. MWF, 11; 455 Agr. (2). Associate Professor NOLAN

Courses for Advanced Undergraduates and Graduates

S91. Agricultural Education.—A course dealing with major problems in agricultural education. Administration, supervision and teaching of agriculture. Special research work to meet the needs of students' interests. Hours to be arranged. 551 Agr. (3-5). Associate Professor NOLAN

Prerequisites: Agr. Educ. 50, 51, and senior standing.

TECHNICAL AGRICULTURE

Professor LEHMAN, Associate Professor BAUER, Assistant Professor ANDERSON, Assistant Professor ROBERTS, Mr. PIEPER

S8. Animal Husbandry. Principles of Breeding.—The organization and study of a course in the elements of *variation*, *heredity* and *evolution* of domesticated animals and plants, for teachers of vocational agriculture. MTWT, 8; 107 Gen. (2). Assistant Professor ROBERTS

S1. Agronomy. Soil Projects.—A course for teachers planning soil surveys and soil improvement projects in their community. An Agricultural open elective. MT, 1-2; 122 Agr. (2). Professor Bauer

S8. Agronomy. Special Farm Crops.—Special crops in which the student is interested. Reading; experiments by pot culture in the green house or by plots in the field. Arrange time. 550 Agr. (2-5). Mr. PIEPER

Prerequisite: Agron. 7.

S15. Farm Mechanics. Farm Shop, Construction and Repair Work.—A course designed for teachers of vocational agriculture. MWF, 3; TT, 3-4; 201 F. M. (2½). Professor LEHMAN

S51. Horticulture. Diseases of Horticultural Crops and their Control.—Field observations and laboratory studies of the principal diseases of economic crops, supplemented by lectures and demonstrations on control measures. Permanent collections of important diseases prepared for the teachers of vocational agriculture. WF, 1, 2; S, 10, 11; 301 Agr. (3). Assistant Professor ANDERSON

Equivalent: Horticulture 51.

ART AND DESIGN

Assistant Professor LAKE

S1. Elementary Art.—Principles of construction and perspective in drawing. Freehand drawing in line and tone from still-life, cast, and nature. MWF, 1, 2; 405 U. H. (2). Assistant Professor LAKE

S9. Art for Common Schools.—The planning and execution of work in the common-school art study; design; blackboard drawing. Lectures on organization, equipment, and the administrative side of the supervisor's work. For supervisors of art, and public-school teachers. TT, 1, 2, 3; 403 U. H. (2). Assistant Professor LAKE

S20. History of the Fine Arts.—Periods and styles of architecture, sculpture, and painting during the Italian Renaissance and to the present time. MWF, 3; 410 U. H. (2). Text: *Apollo* by S. Reinach (Charles Scribner's Sons, New York.) Assistant Professor LAKE

Equivalent: Art and Design 20.

BACTERIOLOGY

Associate Professor TANNER, Mr. THOMPSON

S5a. Introductory Bacteriology.—Lectures, assigned readings, demonstrations, and recitations on bacteria, yeasts, and molds; structure and morphology; systematic relationships; their significance in general sanitation, agriculture, home economics, communicable diseases, etc. (For those who wish an insight into matters of everyday importance, such as sterilization and disinfection, food poisoning, etc.) Designed to accompany Bacteriology S5b but may be elected without it. MTWTF, 8; 229 N. H. (2½). Associate Professor TANNER

Prerequisite: Sophomore standing; one semester of chemistry or consent of the instructor

S5b. Introductory Bacteriology, Laboratory.—Bacteriological technic; study of morphology and physiology of bacteria and certain related microorganisms; preparation of media and apparatus; staining, cultivation, etc. Designed to accompany Bacteriology S5a. MWF, 9-12; 367 Chem. (2½). Mr. Thompson

Prerequisite: Bacteriology S5a or concurrent registration in it; Chemistry 2a, 3a, or 4.

Equivalent: Bacteriology S5a and S5b are equivalent to Bact. 5a and 5b.

Courses for Advanced Undergraduates and Graduates

S20. General Bacteriology.—(For advanced undergraduates and graduate students who do not major in bacteriology). Laboratory methods, technic of cultivation and observation of microorganisms; biochemical reactions; lectures, laboratory, assigned readings and reports. Lecture, MTWTF, 8; 229 N. H. Laboratory, MWF, 9-12; 367 Chem. (5.) Associate Professor Tanner and Mr. Thompson

Prerequisite: Two years college chemistry and junior standing.

S7 or S107.—Research for advanced undergraduates (S7) and graduate students (S107) in bacteriology. Hours and credit to be arranged.

Associate Professor Tanner

BOTANY

Professor Hottes, Assistant Professor McDougall, Mr. Weinard, Miss Pleasants

Courses for Undergraduates

S1. General Botany.—Structure, physiology, natural history, and uses of plants. Intended as a foundation for advanced study in any branch of botany, as well as giving the general knowledge of plant life which every educated person should possess. Lecture, TWT, 9; 228 N. H. Quiz F, 9; 229 N. H. Laboratory, TWTF, 2, 3; 216 N. H. (4). Assistant Professor McDougall and Assistants

S27a. Plant Physiology.—Absorption of materials and their transformation within the organism; production and use of food. Lecture-quiz, MWF, 10. Laboratory, MWF, 8-10, 11; 308 N. H. (4). Professor Hottes

Prerequisite: Botany 1 or its equivalent.

Courses for Advanced Undergraduates and Graduates

S9b. Plant Physiology.—Physiological problems for those specializing in plant physiology or in its applications to plant breeding, crop production, or plant pathology. Arrange time. 104 Botany Annex. (2-4). Professor Hottes

Prerequisite: 10 hours of botany, including Botany 27a or 27b or the equivalent; junior standing.

S25. Plant Ecology.—Advanced studies in the ecology of plants or of plant communities. Arrange time. 304 N. H. (2-4). Assistant Professor McDougall

Prerequisite: Botany 23 and 27a or the equivalent; junior standing.

Courses for Graduates

S102. Plant Physiology.—Research: reports and discussions of results of current literature. Arrange time. 104 Botany Annex. (½-1 unit). Professor Hottes

S109. Plant Ecology.—Research on the interrelations of plants and their environment. Arrange time. 304 N. H. (½-1 unit). Assistant Professor McDougall

BUSINESS ORGANIZATION AND OPERATION

Including Accountancy and Business Law

(See also Economics)

Professor Scovill, Assistant Professor Littleton, Mr. Davidson, Mr. Ham, Mr. Taylor, Mr. Fjeld, and Mr. McIntyre

A. ACCOUNTANCY

Courses for Undergraduates

S1b. Principles of Accounting.—Principles of accounting and their application in the art of bookkeeping. Accounting procedure in double entry, illustrating the use of fundamental accounts and books. Text: *Twentieth Century Bookkeeping and Accounting*, Parts I, II, and III with outfit Set III. Quiz, MWF, 8; Practise, TT, 8, 9; 303 Com. (3). Mr. Taylor

Prerequisite: Accountancy 1a or a similar course.

Equivalent: Accountancy 1b.

S2a-2b. Advanced Accounting.—Fundamentals of cost accounting, theory of partnership and corporation accounts, depreciation, goodwill, reserves and sinking funds; special financial statements, reading balance sheets, illustrative problems. Text: Rowe's *Cost Accounting*; Klein's *Elements of Accounting*; lectures and problems. MTWTFS, Section A, 8, 9; 202 Com. (6); Section B, 10, 11; 202 Com. (6).

Assistant Professor LITTLETON, Mr. FJELD

Prerequisite: Accountancy 1a-1b; credit in Economics 1.

Equivalent: Accountancy 2a-2b.

Courses for Graduates

S110. Accounting Reports.—Methods of presenting reports of audits; investigations and operations. Interpretation of accounting data. Four class hours a week; time to be arranged. (1 unit). Professor SCOVILL

S129. Thesis.—Two class hours a week; time to be arranged. (1 unit).

Professor SCOVILL

B. BUSINESS ORGANIZATION AND OPERATION

Courses for Undergraduates

S1. Business Organization and Operation.—Individual proprietorship, partnership, and corporation; organization for operation; functions and relations of various departments; problems of management. Text: Marshall's *Business Administration* and Jones' *Administration of Business Enterprises*. MTWTFS, 9; 206 Com. (3).

Mr. HAM

Prerequisite: One year of accountancy, Economics 1 or 2.

Equivalent: Business Organization and Operation 1.

S2. Marketing Organization and Operation.—Methods and problems involved in marketing raw materials and manufactured products. Text: Hibbard's *Marketing of Agriculture Products*, and Converse's *Marketing Methods and Policies*. MTWTFS, 10; 206 Com. (3). Mr. MCINTYRE

Prerequisite: Business Organization and Operation 1.

Equivalent: Business Organization and Operation 2.

Courses for Graduates

S129. Thesis.—Time to be arranged. (1 unit). Professor SCOVILL

C. BUSINESS LAW

Courses for Undergraduates

S2. Commercial Law.—Contracts; agency, sales; negotiable instruments; cases; readings and lectures. Text: *Spencer's Manual of Commercial Law*. (Not accepted for credit for students in the College of Commerce and Business Administration.) MTWTF, Section A, 9; 204 Com. (2½); Section B, 11; 204 Com. (2½).

Mr. DAVIDSON

CHEMISTRY

Professor ADAMS, Associate Professor LEWIS, Associate Professor HOPKINS (in charge), Associate Professor BEAL, Assistant Professor REEDY, Assistant Professor BRALEY, Assistant Professor KREMERS, Dr. ENGLIS, Dr. MARVEL, Dr. HURD, Dr. SOUTHER, Mr. BARNES, Miss JUNKIN, Mr. KAUFMANN, Mr. GRAVES

NOTE: All of the courses in chemistry in the Summer Session are equivalent to the courses of the same numbers during the academic year.

Courses for Undergraduates

S1. Elementary Chemistry.—The non-metallic elements. Texts: Noyes' *Textbook of Chemistry*; Noyes and Hopkins' *Laboratory Exercises* (Henry Holt and Company). Lecture-quiz, MTWTFS, 11; 100 Chem. Laboratory, MTWTFS, 8, 9 or 9, 10; (5). Associate Professor HOPKINS, Assistant Professor KREMERS, Dr. HURD, Miss JUNKIN

S1a. Inorganic Chemistry.—For students who have had one year of high-school chemistry. This course may be taken at the same hours as Chemistry S1, but only four hours of laboratory work are required. 100 Chem. (3).
Associate Professor HOPKINS, Assistant Professor KREMERS, Dr. HURD, Miss JUNKIN

S1b. Inorganic Chemistry.—For engineering students. This course may be taken at the same hours as Chemistry S1, but only six hours of laboratory work are required. 100 Chem. (4).

Associate Professor HOPKINS, Assistant Professor KREMERS, Dr. HURD, Miss JUNKIN

S2a. Inorganic Chemistry and Qualitative Analysis.—Chemistry and qualitative analysis of the more common metals and inorganic compounds. Texts: Noyes' *Textbook of Chemistry*; Noyes and Smith's *Qualitative Analysis* (Henry Holt and Company.) Lectures, MTWT, 9; 100 Chem. Quiz, MTWT, 8. Laboratory MTWTFS, 10, 11; (5). Assistant Professor REEDY, Miss JUNKIN

Prerequisite: Chemistry 1 or 1a.

S3a. Inorganic Chemistry and Qualitative Analysis.—For students in chemistry and chemical engineering. Texts: Noyes' *Textbook of Chemistry;* Noyes and Smith's *Qualitative Analysis*. Arrange; 100 Chem. (5).
Assistant Professor REEDY, Miss JUNKIN

S5a. Elementary Quantitative Analysis.—Gravimetric and volumetric methods; stoichiometrical relations, the fundamental laws of chemistry and their application to quantitative analysis. Text: Talbot's *Quantitative Chemical Analysis*. Lecture or quiz, MTWT; 8; 111 Chem. Laboratory, MTWT, 9-12; F, 8-12; 260 Chem. (5).
Associate Professor BEAL, Dr. ENGLIS

S5b. Quantitative Analysis.—(Continuation of Chemistry 5a). Analysis of silicates, metallic compounds, and alloys; advanced qualitative analysis. Lectures; recitations; laboratory. Treadwell-Hall's *Analytical Chemistry*, Vol. I, II. Lecture or quiz, MTWT, 8; 204 Chem. Laboratory, 9-12, (8-12 Fri.); 218 Chem. (5). (Will not be offered for fewer than five students.) Assistant Professor BRALEY

Prerequisite: Chemistry 5a or 13a.

S13a. Agricultural Analysis.—Gravimetric and volumetric analysis; analysis of fertilizers and milk. Parallel with Chemistry 5a. Talbot's *Quantitative Chemical Analysis*. (For students in agriculture and household science). Lecture or quiz, MTWT, 8; 111 Chem. Laboratory, MTWT, 9-12;F, 8-12; 260 Chem. (5).
Associate Professor BEAL, Dr. ENGLIS

Prerequisite: Chemistry 2a or 3a.

Courses for Undergraduates or Graduates

By suitable selection of courses through four consecutive summers it will be possible for persons attending the Summer Session to meet the requirements for the Master's degree, with the exception of the completion of a course in physical chemistry. It is hoped that such a course may be given in subsequent years.

S14a. Elementary Organic Chemistry.—This course should be accompanied by laboratory work, S14c. MTWTFS, 8; 217 Chem. (3). Professor ADAMS

Prerequisite: Chemistry S2a or S3a or equivalent course.

S14b. Organic Chemistry. (second course).—Continuation of Chemistry S14a, with emphasis on special chapters. Library assignments. Not given unless elected by more than three students. MTWTFS, 8; 217 Chem. (3). Dr. SOUTHER

Prerequisite: Chemistry S14a and S14c or equivalent.

S14c. Organic Chemistry. (elementary laboratory).— Typical laboratory methods; syntheses of some of the more important organic compounds. Four times a week, 9-12; 250 Chem. (2). Mr. BARNES

Prerequisite: Registration in Chemistry S14a or completion of a course equivalent to S14a.

S14d. Organic Chemistry (advanced laboratory). — Synthetical preparations in organic chemistry, and quantitative organic analysis. Four times a week, 9-12; 250 Chem. (2). Dr. SOUTHER

Prerequisite: Registration in Chemistry S14b or completion of a course equivalent to S14b.

S15. Physiological Chemistry.—Enzymes; carbohydrates; salivary digestion; gastric digestion; fats; pancreatic digestion; intestinal digestion, bile; putrefaction products; feces; blood; milk; epithelial and connective tissues; muscular tissue; nervous tissue; urine. Qualitative and quantitative work on gastric juice, blood, urine, and milk; the clinical aspect of these topics treated thoroly for the prospective student of medicine. Lectures, demonstrations, conferences; practical work, assigned reading. MTWTF, 8-12; 450 Chem. (5). Associate Professor Lewis, Mr. Kaufmann

Prerequisite: Chemistry 5a or 13a, and 14a-b or 9 and 9c, or equivalent.

S17. Teachers' Course.—Methods of teaching elementary chemistry. TT, 10; 201 Chem. (1). Associate Professor Hopkins

Prerequisite: 13 hours of chemistry and senior or graduate standing.

S21. Qualitative Organic Analysis.—Systematic methods for the identification of pure organic compounds and mixtures. 250 Chem. (3). Four laboratory periods to be arranged in mornings. Mr. Barnes

Prerequisite: Chemistry S14b and S14d or equivalent.

S25. (formerly S5c.) Food Analysis.—Quantitative organic analysis; examination of food and drug products; alcohols, carbohydrates, fats and oils, animal and vegetable foods, nitrogenous bodies, preservatives and colors. Sherman's *Organic Analysis* and Sherman's *Food Products*. Lecture, MTWTF, 11; 204 Chem. Laboratory, MTWTF, 8-11; 218 Chem. (5). Associate Professor Beal

S27. Qualitative Analysis of the Rarer Elements.—The rarer elements and their compounds, identification and separation of the elements; formation, solubilities, and chemical reactions of their salts. Lectures, laboratory. Lecture, W, 9; 303 Chem. Laboratory, arrange. (3). Associate Professor Hopkins

S92. Chemical Literature and Reference Work.—Periods, leaders, journals; use of literature. Lectures, reports, reference work. Two periods a week; arrange. (1). Miss Sparks

Courses for Graduates

S103a. Advanced Analytical Chemistry.—Four to five times per week. (½ unit, 1¼ with laboratory). Assistant Professor Braley

S104e. Advanced Organic Chemistry.—Chiefly laboratory work. The study and development of methods which are suitable for large scale production. (Limited to ten students in 1921). (1 unit).

Professor Adams, Dr. Marvel

S105a. Advanced Physiological Chemistry.—The more difficult biochemical preparations; the use of analytical methods. Lecture and laboratory. One to five times a week. (½-1) unit. Associate Professor Lewis

S11 and S111. Research.—Advanced work for undergraduates (S11) and research work for graduates (S111), in inorganic, organic, analytical, physical, or physiological chemistry. Arrange hours and credit before registration.

Inorganic Chemistry	Associate Professor Hopkins, Assistant Professors Reedy and Kremers
Analytical Chemistry	Associate Professor Beal, Assistant Professor Braley
Physiological Chemistry	Associate Professor Lewis
Organic Chemistry	Professor Adams, Dr. Marvel
Physical Chemistry	Assistant Professor Reedy

THE CLASSICS

LATIN

Professor Oldfather, Professor Canter

S1. Plautus.—Two or more plays will be read with a brief discussion of the language and verse of comedy. MWF, 3; 120 L. H. (1½). Professor Oldfather

Prerequisite: Three years of high school Latin.

S2. Roman Private Life.—The name, the family, the house, the organization of society, marriage, dress, education, amusements, supplemented by the slides and photographs of the department and the collections of the classical museum. TT, 3; 120 L. H. (1). Professor Canter

S3. Teachers' Course.—Special attention to problems and methods of instruction in Latin in the secondary school; considerable time will be devoted to the work of the first, second, third and fourth years; the position of Latin in the curriculum of the high school; the purposes and results of Latin instruction. MTWT, 4; 120 L.H. (2). Professor Canter

S4. Horace.—Selections from the odes. TT, 3; 114 L. H. (1).
Professor OLDFATHER

Prerequisite: One year of college Latin.

S5. The Roman Empire.—The political theories of the empire, the cultural development, the religious invasions from the orient, the causes of the decline and fall. MT WT, 2; 120 L. H. (2). Professor OLDFATHER

Prerequisite: Junior standing. This course is described by the department of history as History S55.

DRAWING, GENERAL ENGINEERING

Mr. WATT

S1. Elements of Drafting.—Engineering lettering; orthographic projection; isometric oblique and perspective drawing; machine sketching; working drawings. Lettering; engineering styles and the making of name plates and titles. Mechanical drawing; drawings from specifications and models with tracings. Dimensioned sketches from parts of standard machines; complete working drawings. Blue-print and VanDykes from tracings. Time sketches of equipment. Text: Miller's *Mechanical Drafting*. 8-11 daily; 303 T. B. (4). MR. WATT

S2. Descriptive Geometry.—Theory of orthographic projection; the point, line, and plane; the properties of surfaces; tangents; intersections, and developments. Practical problems; recitations and drawing room work. Text: Miller's *Descriptive Geometry*. 7-10 daily; 303 T. B. (4). MR. WATT

Prerequisite: Plane and solid geometry.

ECONOMICS

(See also BUSINESS ORGANIZATION and OPERATION)

Professor BOGART, Mr. BROWN, Mr. CRABB, Mr. MILLER

Courses for Undergraduates

S2. Principles of Economics.—Text: Ely: *Outlines of Economics*. MTWTFS. Section A, 8; 101 Com. (3). Section B, 9; 204 Com. (3). Section C, 10; 111 Com. (3).
Mr. MILLER, Mr. CRABB

Prerequisite: One year of university work or (for teachers) the permission of the instructor.

Equivalent: Economics 2.

S3. Money and Banking.—Money; monetary system of the United States; money and prices; credit and banking; domestic and foreign exchange; banking system of the United States compared with other banking systems. Texts: Holdsworth: *Money and Banking*; Phillips: *Readings in Money and Banking*. MTWTF. Section A, 10; 206 Com. (2½). Section B, 11; 206 Com. (2½). Mr. BROWN

Prerequisite: Five-hour course in the principles of economics or the permission of the instructor.

Equivalent: Economics 3 when used as a prerequisite.

Courses for Advanced Undergraduates and Graduates

S24. Industrial Development of Modern Europe.—Text: Ogg: *Economic Development of Modern Europe*. MTWT, 9; 101 Com. (2). Professor BOGART

Prerequisite: Economics 1 or 2, junior standing, or the permission of the instructor.

S51. Public Finance.—Public expenditures; public revenues, especially taxes; justice in taxation; federal, state, and local taxes; war finance. Text: Bogart: *War Costs and their Financing*. MTWT, 10; 101 Com. (2). Professor BOGART

Prerequisite: Five hour course in the principles of economics, junior standing, or the permission of the instructor.

Course for Graduates

S118. Seminar. For graduate students who are writing theses, or are engaged in research work. Time to be arranged. (1-2½ units). Professor BOGART

Prerequisite: Graduate standing.

EDUCATION

Dean CHADSEY, Professor HOLLISTER, Professor CAMERON, Professor MONROE, Professor PHILLIPS, Associate Professor SEYBOLT, Assistant Professor BELTING, Mr. WILLIAMS, Mr. KRUSÉ, Mr. MCCLUSKY, Dr. CAMP

Courses for Undergraduates

S2. History of Education.—MTWTF, 10; 202 L. H. (2½).
Associate Professor SEYBOLT

Prerequisite: Junior standing.

S10a. Technic of Teaching.—Types of classroom exercises with practical work in the preparation of plans for teaching the various secondary-school subjects. (Education S10a and S10b are equivalent to Education 10, which is one of the courses required by Senate ruling for the official recommendation of the University.) Section I, MTWF, 8; Section II, MTWT, 9; Section III, MTWT, 10; 208 U. H. (2).
Professor HOLLISTER, Dr. CAMP

S10b. Class Management.—The technic of class management including a discussion of classroom routine, the sources of waste in poor management, and the problem of school discipline. The course concludes with a discussion of professional ethics in education. (Education S10a and S10b are equivalent to Education 10, which is one of the courses required by Senate ruling for the official recommendation of the University.) Section I, ThS, 8; Section II, TT, 1; Section III, TT, 2; 208 U. H. (1).
Professor HOLLISTER, Mr. KRUSÉ

S25. Educational Psychology.—(Introductory course.) Instinct; habit, and the acquisition of skill; perception and memory; conception, judgment, and reasoning; applications to school subjects; lectures, readings, demonstrations. Section A, MWFS, 9; Section B, MTWT, 8; Section C, MTWT, 10; Section D, MTWT, 11; Section E, MTWT, 1; Section F, MTWT, 2; 419 U. H. Lecture, TT, 9; 218 U. H. (3). Professor CAMERON, Mr. WILLIAMS, Mr. KRUSÉ, Mr. MCCLUSKY

Courses for Advanced Undergraduates and Graduates

S4. Special Problems in Educational Administration.—A consideration from the standpoint of the superintendent of problems relating to the administration of city school systems. TWT, 3; 202 L. H. (1½). Dean CHADSEY

Prerequisite: Senior standing, or experience as a principal or superintendent.

Equivalent: Education 4 (in part.)

S6. Principles of Secondary Education.—The organization and administration of the high school; its purposes and functions in society; a consideration of special problems centering around secondary education. MTWTFS, 10; 218 U. H. (3).
Professor PHILLIPS

S7. Visual Education.—Scope, technic, and application to classroom procedure. Psychological analysis of processes. Criticism of method, and investigations in the field. Demonstration. FS, 11; 207 U. H. (1). Mr. MCCLUSKY

S8. Philosophy of Education.—An examination and constructive criticism of the philosophical principles underlying the current aims, methods and organization of Education. MTWF, 1; 207 U. H. (2). Mr. KRUSÉ

S9. School Building and Sanitation.—Legal aspects of school building; principles involved in locating a site; detailed procedure in planning a building; problems peculiar to high-school construction; types of structures as related to local conditions; interior equipment of the building; structure and location as related to sanitation; lighting adjustments; heating and ventilation; cleaning and janitor service; cloakrooms and lockers; water supply; guarding against infection; other sanitary features. MTWT, 9; 207 U. H. (2). Professor HOLLISTER

S17. The Teacher.—Preparation, selection, placement agencies, requirements for certification, salary, pensions, methods of promotion in service, professional ethics. Lectures, readings, and discussions. TT, 3; 211 U. H. (1). Mr. WILLIAMS

S21. Supervision of Instruction of Elementary School Subjects.—The purpose of this course is to work out a practical program for the constructive supervision of such subjects as: silent reading, oral English, spelling, writing, composition, literature, arithmetic, elementary science, social science, hygiene, music, and art. Special attention will be given to the following phases of method: interest, the assignment, teaching pupils to study, the socialized recitation, the problem-project method and the need for summaries, drill, and reviews. MWFS, 10; 311 U. H. (2).
Dr. CAMP

S22. High-School Educational Measurement.—The administration and interpretation of educational tests with especial reference to high school problems. TWTF,2; 211 U. H. (2). Professor Monroe

S23. Educational Statistics.—The practical application of statistical method to educational investigation. Methods of gathering data, calculations of statistical measures, and interpretations. TWTF, 10; 211 U. H. (1). Professor Monroe

S28. The Community and Its High School.—The growth and development of the community: Political, economic and social changes; the high school as an exponent of these changes; the community institutional relationship to the high school; the function of principal and teachers in the community; social complexion of the pupils. The holding power of the high school as a community problem; the factors in a plan for universal secondary education; consideration of the factors in an economical high school; community significance of the ways of teaching and learning; the curriculum and its community aspects; secondary extension education. MTWT, 1; 306 L. H. (2). Assistant Professor Belting

S30. History of American Education.—MTWTF, 9; 202 L. H. (2½). Associate Professor Seybolt

Prerequisite: Senior standing and Education 2, or Education 11.

S45. Advanced Educational Psychology.—MTWT, 2; 417 U. H. (2). Professor Cameron

Prerequisite: Education 25.

S60. High School Administration.—The state and its relation to secondary education; administrative organization of state and local board of control; certification of teachers; salary schedules; professional preparation of teachers; administrative relationships of teachers and principals; supervision; teachers' meetings; text-books; organizations of high school institutes and conferences; provision for individual differences; principals' reports. MTWT, 11; 312 U. H. (2). Assistant Professor Belting

Courses for Graduates

S101. Seminar in Educational Theory.—T, 4-6; 103 L. H. (½ unit.) Professor Cameron

S104. Seminar in Problems in Educational Administration.—W, 4-6; 103 L. H. (½ unit.) Dean Chadsey

S106. Seminar in High School Administration.—Th, 4-6; 103 L. H. Assistant Professor Belting

S124. Seminar in Educational Research.—M, 4-6; 103 L. H. (½ unit.) Professor Monroe

S125. Seminar in Educational Psychology.—F, 4-6; 103 L. H. (½ unit.) Professor Cameron

S126. Educational Sociology.—MTWTF, 2; 306 L. H. (½ unit.) Professor Hayes

Prerequisite: Graduate standing or consent of instructor.
Equivalent: Sociology 26. This is the same course as Sociology S126.

ENGLISH

A. LANGUAGE AND LITERATURE

Professor Dodge, Associate Professor Jones, Assistant Professors Baldwin, Hillebrand, and Hunt, Dr. Bundy, Mr. Dolch, Mr. Brady, Mr. Rice, Miss Nelson, Mr. Douglas, Mr. Secord, Mr. Clippinger

Courses for Undergraduates

S1a. Survey of English Literature.—Chaucer and his contemporaries, the popular ballads, Malory, the Renaissance, the Reformation, Elizabethan Prose, Spenser, the Elizabethan lyric, Shakespeare, Bacon, Cavalier lyrics, religious lyrics, Milton. Text: *Century Readings in English Literature* (Part I). MTTF, two sections: A at 8; B at 9; 307 U. H. (2). Associate Professor Jones, Mr. Rice

Prerequisite: One year of college work or the equivalent.
Equivalent: First half of English 1. (Together with S1b this course covers the work of English 1. To be credited as equivalent to English 1, S1b and S1a should be taken simultaneously.)

S1b. Survey of English Literature.—Bunyan and the prose of the Puritans, the Restoration, Dryden, Swift, the periodical essayists, Pope and the pseudoclassical school, DeFoe and the novelists, Thomson, Gray, Samuel Johnson, Goldsmith, Cowper, Burns. Text: *Century Readings in English Literature* (Part I). MTTF, 11; 307 U. H. (2). Mr. Rice

Prerequisite: One year of college work or the equivalent.

Equivalent: Second half of English 1. (To be credited as equivalent to English 1, S1b and S1a should be taken simultaneously.)

S21. Literary Study of the Bible.—Hebrew literature as an expression of the life of the race that produced it; the debt, both ethical and artistic, of modern life to ancient Hebrew thought, with special emphasis on our obligations to the Hebrew prophets for our ideals of world peace and social righteousness. MTWT, 9; 218 L. H. (2).
Assistant Professor Baldwin

Prerequisite: Six hours of English literature, or junior standing.

Equivalent: English 21 (in part).

S23. Introduction to Shakespeare.—Two Gentlemen of Verona, A Midsummer Night's Dream, Richard III, Romeo and Juliet, Twelfth Night, Othello, King Lear, The Tempest. Text: Hudson *Shakespeare*. MTWTF, 8; 202 L. H. (2½).
Assistant Professor Hillebrand

S3. The Poetry of Milton.—All Milton's poetry will be read both as an expression of the life of the age and as an expression of Milton's individual genius. MTWTFS, 11; 218 L. H. (3). Assistant Professor Baldwin

Prerequisite: Ten hours of English literature or two years of college work and the consent of the instructor.

Equivalent: English 3.

S8. Old English. (Anglo-Saxon).—Grammar, with specimens of prose and the shorter poems. Text: Bright's *Anglo-Saxon Reader*. MTWTFS, 10; 110 L. H. (3).
Professor Dodge

Prerequisite: Ten hours of English literature or two years of college work.

Equivalent: English 8.

S35. The English Drama before Shakespeare.—The Miracle and Morality plays. Interludes, Udall, Lyly, Kyd, Marlowe, Peele, Greene, etc. MTTF, 11; 110 L. H.(2).
Professor Dodge

Prerequisite: Ten hours of English literature or two years of college work.

Equivalent: English 35 (in part).

S45. Contemporary European Drama.—The "theatre of ideas." Teutonic naturalism, and the peasant drama of England and Ireland. Modern stage-craft. Ibsen, Strindberg, Hauptman, Schnitzler, Hofmannsthal, Zola, Becque, Brieux, Hervieu, Maeterlinck, Shaw, Galsworthy, Masefield, Barker, Synge, Fitch, Moody, and others. MTWTF, 9; 110 L. H. (2½). (Attention of those who register in this course is called to Public Speaking S10.) Assistant Professor Hillebrand

Prerequisite: Ten hours of English literature or two years of College work.

Equivalent: English 45 (in part).

Courses for Graduates

S101. Research in Special Periods.—Individual conferences arranged with graduate students engaged upon definite pieces of investigation. (1 unit).
Professor Dodge, Associate Professor Jones, Assistant Professors Baldwin and Hillebrand, Dr. Bundy

S120. History of Literary Criticism.—MTWT, 9; 220 L. H. (1 unit). Dr. Bundy

S128. English Literature in the Sixteenth Century.—MTWT, 10; 218 L. H. (1 unit). Associate Professor Jones

B. RHETORIC

Dr. Bundy, Mr. Dolch, Mr. Brady, Mr. Douglas, Mr. Secord, Mr. Clippinger

Courses for Undergraduates

S1. Rhetoric and Themes.—Principles of structure; grammar; punctuation; the sentence; reasoning processes. Four short themes a week and an occasional long theme. Oral and written exercises. Texts: Woolley's *Handbook of Composition*, and Canby's *English Composition*. MTWTFS, two sections; A at 1, B at 2; 309 U. H. (3). Mr. Brady, Mr. Douglas

Prerequisite: Entrance credit in English.

Equivalent: Rhetoric 1.

S2. Rhetoric and Themes.—Principles of argumentation, narration, and description. Text: Woolley's *Handbook of Composition* and Canby's *English Composition.* MTWTFS, two sections; A at 2; B at 3; 308 U. H. (3). Mr. Brady, Mr. Secord

Prerequisite: Rhetoric 1.

Equivalent: Rhetoric 2.

S3. Exposition.—Themes or topics of general interest; analysis of facts and ideas, literary reviews and criticisms; informal essays. Intended for those who write correctly yet desire further practise in composition. MTWTFS, 8; 110 L. H. (3).
Dr. Bundy

Prerequisite: Rhetoric 1-2.

Equivalent: Rhetoric 3.

S6. Narrative Composition.—Practise in short story writing with some study of models. (Intended for those who have some aptitude for literary work.) MTWTFS, 11; 202 L. H. (3). Mr. Dolch

Prerequisite: Two years of college work and the consent of the instructor.

Equivalent: Rhetoric 6.

S10. Business Writing.—Correspondence; sales letters; practise in writing business reports and summaries. Lectures and discussions. (Not counted toward a major in English). MTTS, two sections; A at 10, B at 11; 302 U. H. (2).
Mr. Dolch, Mr. Clippinger

Prerequisite: Rhetoric 1-2.

Equivalent: Rhetoric 10.

C. PUBLIC SPEAKING

Professor Hunt, Miss Nelson

S1. Oral Expression.—Vocal methods, relation of the voice to the interpretation of thought. MTTF, two sections: A at 8, B at 9. 318 U. H. (2).
Professor Hunt, Miss Nelson

Prerequisite: Rhetoric 1 and 2 or equivalent.

Equivalent: Public Speaking 1.

(Credit is not given for this course unless it is followed by Public Speaking 2, 10, or their equivalents).

S10. Interpretation.—Oral reading of types of literature; extracting the speech values from the printed page. MTTF, two sections: A at 8, B at 10. 314 U. H. (2). Professor Hunt, Miss Nelson

Prerequisite: Public Speaking 1 or equivalent.

Equivalent: Public Speaking 10.

S2. Extempore Speaking.—Original discussions for improvement of delivery and arrangement of thought and language. TT, 11; 318 U. H. (1). Miss Nelson

Prerequisite: Public Speaking 1 or equivalent.

Equivalent: Public Speaking 2 (in part).

S12. Problems in the Teaching of Oral English.—Primarily for high school teachers. MW, 9; 315 U. H. (1). Professor Hunt

Prerequisite: The consent of the instructor.

Equivalent: Public Speaking 12 (in part).

ENTOMOLOGY

Professor Metcalf, Dr. Glasgow

Courses for Undergraduates

S1. General Entomology.—Introduction to the study of insects in the field and laboratory. The structure, functions, life-histories, habits, adaptations, inter-relations and classification of insects. Methods of collecting, preserving and preparing insects for study; recognition of common species and their work; and the preparation of a permanent collection. Lectures, demonstrations, assigned readings, laboratory and field work. Especially recommended to prospective teachers. Text: Kellogg's *American Insects.* MTTF, 1, 2, 3; 408 N. H. (3). Dr. Glasgow

S4. Economic Entomology.—The importance of insects to all forms of human activity. Methods of benefit and injury; life-histories, recognition and control of the more important pests of field, garden, orchard, greenhouse and ornamental plantings, stored products, the household, domestic animals and man. Practical problems in field work, and practise in spraying, dusting, fumigating, the utilization of natural

enemies, farm practises and mechanical measures, largely replace laboratory and theoretical work. The student prepares an economic collection. Especially recommended to agricultural and horticultural students and prospective farm advisers. Text: Sanderson and Paeirs *Insect Pests of Farm, Garden and Orchard.* MWF, 1, 2, 3; 217 N. H; and TT, 3; 229 N. H. (3).

Courses for Advanced Undergraduates and Graduates

S2. Advanced Entomology.—Instruction to meet the needs of the individual student, with emphasis on classification, morphology, biology, or some special economic group such as insect pests of fruits, vegetables, field crops, man or domestic animals. Time to be arranged, forenoons; 104 Vivarium. (2 or 3). Dr. GLASGOW

Course for Graduates

S108. Research in Entomology.—Accepted for credit toward a master's or doctor's degree. (1 or 2 units). Professor METCALF

GEOLOGY

(Including MINERALOGY, PALEONTOLOGY, and GEOGRAPHY)

Assistant Professor BLANCHARD, Miss ASHTON

S1. Principles of Geography.—A study of the essential phases of mathematical geography, climate and weather, physiographic processes and the changes they produce, natural resources, and the response of man to each of the above. MTWTF, 8-10; Laboratory, TT, 2-4; 241 N. H. (5). Text: Salisbury, Barrows, and Tower's *Elements of Geography.* Miss ASHTON

S8. Geography of Europe.—Influence of climate, surface features, and natural resources upon the distribution of peoples, their industries and routes of trade. New boundaries and economic problems in their geographic setting. MTWTF, 9; 241 N. H. (2½). Text: Bowman's *The New World.* Assistant Professor BLANCHARD

Prerequisite: Geography 1, its equivalent, or on consultation.

S14. Weather and Climate.—Elementary study of the atmosphere, weather conditions, forecasting, with practise in reading instruments and graphing data. Practical aspect of subject emphasized, with particular reference to the influence of weather and climate on man and his industries, especially agriculture. MTWTF, 11; (2½). Text: Milham's *Meteorology.* Assistant Professor BLANCHARD

GERMAN

Assistant Professor WILLIAMS, Dr. UHLENDORF, Mr. SCHLAUDT, Mr. WEBER

S1. Beginners' Course.—Schmidt and Glokke's *Das erste Jahr Deutsch* (Heath). MTWT, 1, 2; 310 U. H. (4). Mr. WEBER

Equivalent: German 1 or one year of high-school German.

S3. Reading and Grammar.—(Continuation of beginners' course). MTWT, 3, 4; 310 U. H. (4). Mr. SCHLAUDT

Prerequisite: German 1, S1 or one year of high-school German.

Equivalent: German 3 or two years of high-school German.

S4. Prose Reading.—Narrative prose, sight reading, writing. MTWT, 3, 4; 205 L. H. (4). Dr. UHLENDORF

Prerequisite: German 3 (or 2), or two years of high-school German, or equivalent.

Equivalent: German 4.

S6. Scientific German.—Rapid reading of a general scientific character. MTWT, 3, 4; 215 L. H. (4). Assistant Professor WILLIAMS

Prerequisite: German 4, or three years of high-school German, or equivalent.

Equivalent: German 6.

S16. Conversation and Composition.—Elementary course. TT, 2; 205 L. H. (1). Dr. UHLENDORF

Prerequisite: German 5 (or 6), or equivalent.

Equivalent: German 16 (in part).

S24. Modern German Drama.—Rapid reading. MWF, 2; 215 L. H. (1½). Assistant Professor WILLIAMS

Prerequisite: German 5 (or 6), or equivalent.

Equivalent: German 24 (in part).

HISTORY

Professor OLDFATHER, Professor RAMSDELL, Dr. GOTTSCHALK, Mr. ROBERTS

Courses for Undergraduates

S1c. The History of Modern Europe, 1815-1871.—MTWT, 10; 305 L. H. (2). Dr. GOTTSCHALK

Equivalent: The third one-fourth of History 1a-1b.

S2b. The Political and Social History of Modern England, 1660-1919.—MTWTFS, 8; 305 L. H. (3). Dr. GOTTSCHALK

Equivalent: History 2b.

S3c. American History, 1877-1919.—Economic changes and party readjustments; "big business;" the war with Spain; the Roosevelt policies; the Wilson program; the Great War. MTWTF, 9 (Sec. A), or 2 (Sec. B); 311 L. H. (2½). Mr. ROBERTS

Prerequisite: Sophomore standing.

Courses for Advanced Undergraduates and Graduates

(At least junior standing is required for all the courses in this group.)

S12. The Preliminaries of the Civil War, 1845-1861.—The annexation of Texas and Oregon; the war with Mexico; the crisis of 1849-1850; the Republican party; the secession movement. MTWT, 8; 311 L. H. (2). Professor RAMSDELL

Prerequisite: One year of college history.

S15. Reconstruction after the Civil War, 1863-1877.—War aims in the North; the reconstruction policies of Lincoln and Johnson; Congressional reconstruction; the South under reconstruction; business and politics in the North. MTWT, 11; 311 L. H. (2). Professor RAMSDELL

Prerequisite: One year of college history.

S55. The Roman Empire.—The political theories of the Empire; the cultural development; the religious invasions from the Orient; the causes of the "decline and fall." MTWT, 2; 120 L. H. (2). Professor OLDFATHER

(Attention is called to Latin S2; Roman Private Life.) This is the same course as Classics S5.

Courses for Graduates

S101. Seminar in American History.—Selected problems in the history of the Civil War. Twice a week; time to be arranged. (1 unit). Professor RAMSDELL

S155. Research in Greek or Roman History.—Personal conferences with students who desire guidance in research. (½-1 unit). Professor OLDFATHER

INDUSTRIAL EDUCATION

Mr. BRAUCHER

S1. Manual Arts.—First course. Woodwork practise and methods. MTWTF, 8-10; U. H. S. (2½).

S2. Manual Arts.—Advanced course. Woodwork machine course. Practise and methods. MTWTF, 8-10; U. H. S. (2½).

S8. Manual Arts.—Advanced course. House construction problems, practise and methods. MTWTF, 2-4; U. H. S. (2½).

S62. History and Organization of Manual Arts.—A survey of the development of Manual Arts in America and problems in organization and administration. MTWTF, 11; 208 U. H. (2½).

S3. Mechanical Drawing.—(Same as G. E. D. S1).

LIBRARY SCIENCE

Director WINDSOR, in charge, Mr. CLEAVINGER, Miss BOND, Miss BOYD

Application blanks for admission must be secured from the Director of the School; these should be filled out and returned to him, together with such additional statements as the candidate may offer, showing his qualifications for admission. The application must be filed sufficiently early to enable the School to receive replies from librarians and others who have personal knowledge of the applicant.

Eight-Weeks Courses for College Graduates

Courses of the regular two-year curriculum are offered to college graduates who can satisfy the entrance requirements. These courses are accepted for credit toward the B.L.S. degree. Admission to these courses is conditional on the presentation of credentials showing that the applicant holds a bachelor's degree in arts or science from the University of Illinois or has had other equivalent training.

S17. Classification and Subject Headings.—The principles of book classification, special emphasis being placed on practise in using the Dewey Decimal Classification. Subject headings are assigned in connection with classification. MTWTFS, 9; (3). Mr. Cleavinger

S18. Cataloging.—Dictionary cataloging is followed by a briefer study of classed cataloging. Each student makes a sample catalog of representative books. The American Library Association rules are used as a text. MTWTFS, 8; (3). Miss Bond

S20. Loan Department.—The principles underlying the relations of the library to the public brought about by the loan of books, and the character of the service to be rendered; representative loan systems suitable for various types of libraries, and rules, regulations, and practises incidental to the service. WF, 10; (1). Mr. Cleavinger

S23a. Library Administration and Current Library Literature.—The current library periodicals, bulletins, reports, etc., are examined, and are reported upon in class. A brief consideration of the administration of small libraries, and the selection of government documents most useful to them. TT, 11; (1). Miss Boyd

S30. Practise.—Work in the various departments of the University library. (3). Miss Bond

Prerequisite: Library 17 and 18.

Six-Weeks Course for High-School Graduates

These courses are open (1) to librarians, library assistants, and teacher-librarians, and to others under definite appointment to such positions; and (2) to others, with the consent of the Director, who have completed one year of study in a college or normal school. There are no entrance examinations, but in all cases the completion of a four-year course in an accredited high school or its equivalent is required. No credit toward the B.L.S. degree is given for the work, but a statement of grades is issued by the Registrar of the University.

As the number of students who can be accommodated is limited, preference will be given to applicants from Illinois. No application received from persons outside the State will be definitely accepted before May 1; such applications will be filed in the order of their receipt, and held until that date.

The subjects in which instruction is given are grouped under the following heads. Two hours of study are expected of the student in preparation for each class hour. These courses, taken together, occupy all the working hours of the student.

S1. Classification, Cataloging, Book Numbers.—Practise in classifying books according to the Dewey Decimal Classification, and the preparation of a dictionary catalog. Five class hours a week.

S32. Reference Work.—The more important books of reference, and particularly those suited to the small public library. Three class hours a week.

Prerequisite: Employment as librarian or registration in S1.

S3. Selection of Books.—The principles of book selection, with discussion of the literature of special subjects by members of the University faculty. Two class hours a week.

S4. Libraries and Children.—Management of children's rooms; work with schools; selection of children's literature, illustrated by the use of a good collection of children's books. Two class hours a week.

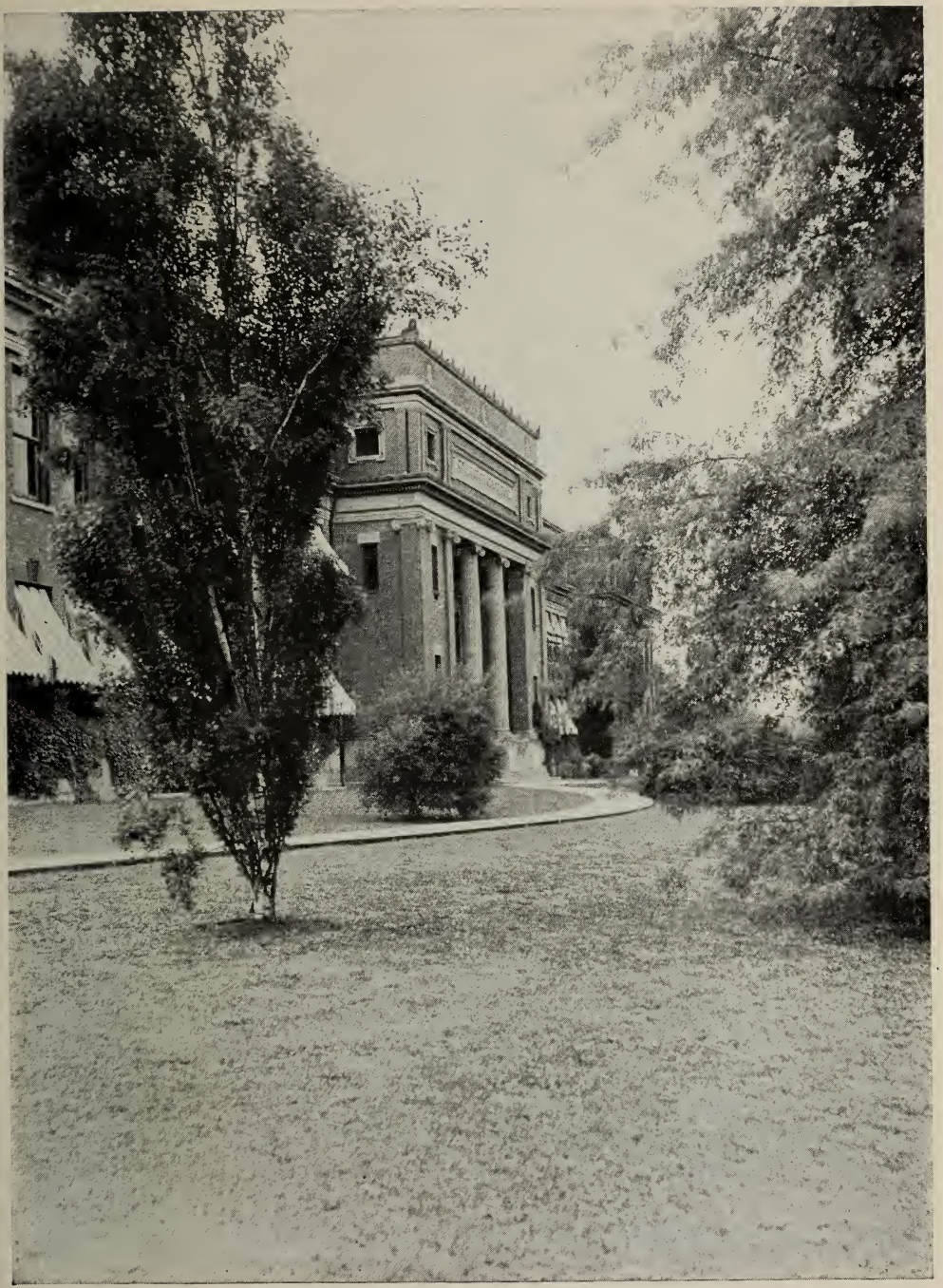
S5. Order, Accession, etc.—Order, accession, shelf, and loan records; trade bibliography; the checking of periodicals; mechanical preparation of books; mending and repair. Two class hours a week.

S6. Library Administration and Extension.—Lectures and round table discussions of library rules, accounts, finance, extension methods and laws, and of buildings and equipment. Two class hours a week.

MATHEMATICS

Professor Miller, Professor Shaw, Associate Professor Emch, Assistant Professor Lytle, Dr. Green, Dr. Camp, Mr. Bender, Mr. Tschudi

The department offers at least five courses each summer for graduates and advanced undergraduates. These courses vary from year to year so as to enable advanced students to secure a suitable sequence of courses during four or five successive summer sessions.



Agricultural Building

The Woman's Building

Mathematics Library and Models

The Mathematics Library now contains more than 6,000 volumes. Fifty current mathematical periodicals are received in addition to a large number of serials devoted partly to mathematics and available in the general library. The Mathematics Library will be open to all students during certain hours of each day except Sunday, but graduate students in mathematics can secure keys which will enable them to use this library whenever the outside doors of the Natural History Building, in which it is located, are open.

A large collection of mathematical models is exhibited in cases located in the halls adjoining the mathematics recitation rooms and the Mathematics Reading Room. This collection includes models relating to the following subjects: Quadratics of all kinds, surfaces of the third and fourth order, surfaces of high orders, line geometry, curves in space, differential geometry, descriptive and projective geometry, analysis situs, mechanics, and kinematics. It also includes devices and machines for mechanical computation, integration, and harmonic analysis.

The Mathematics Club will meet every Friday at 4 p. m. in Room 434 Natural History Building for the consideration of mathematical questions of general interest, especially questions relating to the teaching and the history of mathematics. These meetings will be open to all students who may be interested and will usually last for an hour.

Courses for Undergraduates

S2. College Algebra.—Text: Rietz and Crathorne's *College Algebra.* MTWTFS, Section A, 11; 419 N. H.; Section B, 11; 422 N. H. (3).
Professor Shaw, Assistant Professor Lytle

Prerequisite: Two and one-half units entrance mathematics.
Equivalent: Mathematics 2.

S4. Plane Trigonometry.—Text: Rothrock's *Trigonometry.* MTWTF, 10; 425 N. H. (2). Dr. Green

S6. Analytical Geometry.—Introductory plane and solid analytic geometry. Text: Crawley and Evans' *Analytic Geometry.* MTWTF, 10 and 11; 418 N. H. (5).
Mr. Bender

Prerequisite: Mathematics 2 and 4.
Equivalent: Mathematics 6.

S7. Differential Calculus.—Course for beginners. Townsend and Goodenough's *Essentials of Calculus.* MTWTF, 8 and 9; 422 N. H. (5). Mr. Tschudi

Prerequisite: Mathematics 6.
Equivalent: Mathematics 7.

S9. Integral Calculus.—Text: Townsend and Goodenough's *Essentials of Calculus.* MTWTFS, Section A, 9; 419 N. H.; Section B, 9; 423 N. H. (3).
Associate Professor Emch, Dr. Camp

Prerequisite: Mathematics 7.
Equivalent: Mathematics 9.

Courses for Advanced Undergraduates and Graduates

S12. Advanced Algebra.—Outline of the subjects treated in algebra; complex numbers; infinite series; substitutions. MTWTF, 11; 431 N. H. (2½).
Professor Miller

Prerequisite: Mathematics 9.

S16. Differential Equations.—Text: Murray's *Differential Equations.* A first course in differential equations, practically equivalent to the first semester of Mathematics 16. MTWTF, 8; 425 N. H. (2½). Dr. Camp

Prerequisite: Mathematics 9.

S20. Advanced Analytic Geometry.—Cross-ratio; inversion; poles and polars; solid analytic geometry; applications. MTWTF, 9; 425 N. H. (2½). Dr. Green

S35. Teachers Course.—High School algebra and geometry; educational value; analysis of content; movements influencing content. MTWTF, 10; 422 N. H. (2½).
Assistant Professor Lytle

Prerequisite: Eighteen hours of college mathematics or the consent of the instructor for teachers with experience.

S80. History of Mathematics.—A critical study of Cajori's *History of Mathematics.* MWF, 9; 418 N. H. (1½). Professor Miller

Prerequisite: Mathematics 9.

Courses for Graduates

S100. Seminar on Group Theory.—TT, 9; 418 N. H. (1 unit). Professor MILLER

S133. Geometric Transformations.—MTWTF, 10; 423 N. H. (1 unit). Associate Professor EMCH

S140. Vector Methods.—MTWTF, 8; 431 N. H. (1 unit). Professor SHAW

MECHANICAL ENGINEERING

Professor GOODENOUGH, Professor KRATZ

S13. Thermodynamics.—The transformation of heat into work; the second law and its connection with irreversible processes; the properties of heat media; the perfect gases; saturated and superheated vapors; the flow of fluids. Six times a week. (3). Professor GOODENOUGH

Prerequisite: Mathematics 9 and Physics 1 and 3.

Courses for Graduates

S107. Thermodynamics.—Application of thermodynamics to the solution of physical and engineering problems. (½ unit). Professor GOODENOUGH

S112. Laboratory Investigations.—Combustion of fuel; boiler economy; steam engines and turbines; gas engines and producers; properties of explosive mixtures; mechanical refrigeration. Original work. Six times a week. (½ unit). Professor KRATZ

MECHANICS, THEORETICAL AND APPLIED

Professor MOORE, Professor SEELY, Assistant Professor ENSIGN, Assistant Professor PUTNAM, Assistant Professor WESTERGAARD

S20. Analytical Mechanics.—Statics, kinematics, centroids, and friction. Seely and Ensign's *Analytical Mechanics for Engineers.* MTWTFS, 10; Section A, 202 E. H.; Section B, 208 E. H. (3). Assistant Professor ENSIGN, Assistant Professor WESTERGAARD

Prerequisite: Mathematics 7, registration in Mathematics 9.

S21. Analytic Mechanics.—Kinetics. Seely and Ensign's *Analytical Mechanics for Engineers.* TWTF, 1; 202 E. H. (2). Assistant Professor ENSIGN

Prerequisite: Mathematics 9; Theoretical and Applied Mechanics 20.

S25. Resistance of Materials.—The mechanics and properties of materials used in construction; experiments in testing laboratory; problems. Merriman's *Mechanics of Materials.* Quiz. MTWTFS, 11; 202 L. A. M.; laboratory MW, 8-10; L. A. M. (4). Assistant Professor PUTNAM

Prerequisite: Mathematics 9; Theoretical and Applied Mechanics 20.

For Advanced Undergraduates and Graduates

S41. Advanced Mechanics of Materials.—Special problems met in engineering. Thick cylinders, guns, curved beams, hooks, chain links, rings, unsymmetrical bending, flat plates, resistance to impact loads and to repeated loading; collapsing pressure of thin-walled vessels. Exact versus approximate analysis. Methods of extending approximate analysis. General methods of attack. The application of mechanics to special machine parts and structures. MTWTFS, 10; 305 E. H. (3 credits, ½ to 1 unit). Professor SEELY

Prerequisite: Theoretical and Applied Mechanics 25 or its equivalent.

S42. Properties of Materials.—Various properties of structural materials; their importance in engineering; method of determining the properties; influence on properties of methods of manufacture, chemical composition, heat treatment, mechanical working, etc.; specifications and inspection. TWTF, 8; 202 E. H. (2 credits or ½ unit). Professor SEELY

Prerequisite: Theoretical and Applied Mechanics 25 or its equivalent.

S44. Laboratory Work in Testing Materials.—Study of testing machines and strain measuring apparatus; practise in making tests in tension, compression, and flexure; torsion tests, impact tests, hardness tests, repeated stress tests, and tests of special forms. Systematic tabulation and reduction of test data. Laboratory and computing room periods. MWF, 1-4; L. A. M. (3 credits, ½ to 1 unit). Professor MOORE

Prerequisite: Theoretical and Applied Mechanics 25 or its equivalent.

S45. Advanced Technical Mechanics.—General theories of deformation of structures, in particular, of statically indeterminate structures, graphical and algebraic methods of ana ysis; virtual work, substitute structure, slope-deflection, etc. Application to a variety of structures in different fields of engineering. TWTF, 9; 202 E. H. (2 credits, ½ to 1 unit). Assistant Professor WESTERGAARD

Prerequisite: Theoretical and Applied Mechanics 25 or its equivalent.

Courses for Graduates

S101. Analytical Mechanics.—The historical development of methods of analysis; advanced problems in statics and dynamics; a comparative study of texts. Four times a week. (1 unit.) Professor MOORE

MUSIC

(For fees, see page 11).

Director STIVEN, Mr. VAN DEN BERG, Mr. JOHNSON, Mr. BERESFORD, Miss PHILLIPS, Miss TREAT

S2b. History of Music.—Music of modern schools of different nations. Collateral reference work and note books are required. TT, 11; 106 S. M. H. (1). Director STIVEN

Prerequisite: The consent of the instructor.

Equivalent: Music 2 (second half).

S4a. Harmony.—Dominant seventh chords and their resolutions; key relations and simple transitions. MW, 11; 106 S. M. H. (1). Director STIVEN

Prerequisite: Music 3.

Equivalent: Music 4 (first half).

S13a. Musical Appreciation.—Structural development of and acquaintance with famous classics of music from an appreciative view point; numerous illustrations with victrola and piano. WF, 8; 103 S. M. H., (1). Director STIVEN

S21b. Ear Training, Elementary Course.—Formation and recognition of intervals, separately and in combinational rhythmic drill; melody making and writing. MW, 8; 106 S. M. H. No university credit. Miss PHILLIPS

Prerequisite: Entrance credit.

Equivalent: Music 21a (second half).

S23b. Sight Singing, Elementary Course.—Music notation; scale structure; solfeggio. TT, 8; 106 S. M. H. No university credit. Miss PHILLIPS

Prerequisite: Entrance credit.

Equivalent: Music 23a (second half).

S25b. Public School Music Methods.—Problems of supervision in the High School; study of material and technic of teaching. MTWT, 9, 10; 106 S. M. H. (4). Miss PHILLIPS

Prerequisite: Two years of sight reading and the consent of the instructor.

Equivalent: Music 25a (in part). (Music S25a, as given in 1921 Summer Session, and Music S25b, as above, complete the work of Music 25a.)

S41a-41f. Introductory Course in Piano.—Arrange hours. No university credit. 100 S. M. H. Mr. VAN DEN BERG, Miss TREAT

Prerequisite: The consent of the instructor.

Equivalent: Music 41a-41f (in part).

S42-46. Piano, Collegiate Grade.—Arrange hours. 100 S. M. H. (1 or 2). Mr. VAN DEN BERG, Miss TREAT

Prerequisite: Three years of piano study.

Equivalent: Music 42-46 (in part).

S47. Piano, Collegiate Grade.—For students in other schools and colleges of the University. Arrange hours. 100 S. M. H. Mr. VAN DEN BERG, Miss TREAT

Prerequisite: Three years of piano study.

Equivalent: Music 47 (in part).

S51a-51f. Introductory Course in Voice.—Arrange hours. 100 S. M. H. No university credit. Mr. JOHNSON, Mr. BERESFORD

Prerequisite: The consent of the instructor.

Equivalent: Music 51a-51f (in part).

S52-56. Voice, Collegiate Grade.—Arrange hours. 100 S. M. H. (1 or 2). Mr. Johnson, Mr. Beresford

Prerequisite: Three years of vocal study.

Equivalent: Music 52-56 (in part).

S57. Voice, Collegiate Grade.—For students in other schools and colleges of the University. Arrange hours. 100 S. M. H. (1). Mr. Johnson, Mr. Beresford

Prerequisite: Three years of vocal study.

Equivalent: Music 57 (in part).

S81. Organ.—Arrange hours. 100 S. M. H. (1). Miss Treat

Prerequisite: Three years of piano study or the equivalent.

Equivalent: Music 81 (in part).

S83. Organ.—For students in other schools and colleges of the University. Arrange hours. 100 S. M. H. (1). Miss Treat

Prerequisite: Three years of piano study or the equivalent.

Equivalent: Music 83 (in part).

Students desiring to take organ will be obliged to pass without condition the entrance examination for collegiate standing in piano.

Campus sings, Wednesday evenings, at 7:00, Auditorium steps.

PHILOSOPHY

Associate Professor McClure

Course for Undergraduates

S1. Logic.—MTWTFS, 10; 113 L. H. (3). Associate Professor McClure

Prerequisite: One year of University work.

Course for Advanced Undergraduates and Graduates

S3. History of Philosophy.—Greek Philosophy.—MTTF, 11; 113 L. H. (2). Associate Professor McClure

Prerequisite: Three hours in Philosophy; junior standing.

PHYSICAL EDUCATION FOR MEN

Director Huff, Professor Zuppke, Assistant Professor Lundgren, Assistant Professor Griffith, Mr. Gill, Mr. Winters, Mr. Bearg, Mr. Ingwersen, Mr. Staley, Mr. Bullock, Mr. Wagner, Mr. Brown

S10a. Baseball Theory.—Theory of batting; base running; proper methods of fielding each position; team work and coaching methods; study of the rules, and a general study of fundamentals. MTW, 11. (1). Director Huff

S10b. Baseball Practise.—The principles discussed in S10a will be practised in the various sections. Each section will meet three times a week. (½). Sec. A, 9, MTW. Sec. B, 9, ThFS. Sec. C, 10, MTW. Sec. D, 11, ThFS. Mr. Lundgren

S11a. Track and Field Theory.—The theory of starting, sprinting, distance running, hurdling, high and broad jumping, pole vaulting, shot putting, hammer, discus, and javelin throwing. Practical talks on the methods of preparing contestants for different athletics events; rules of competition; study of physical condition, including endurance, speed, and fatigue. Work is assigned for the promotion, management, and officiating of games and meets. ThFS, 8. (1). Mr. Gill

S11b. Track and Field Practise.—The principles discussed in S11a will be practised in the various sections. (½). Sec. A, 9, ThFS. Sec. B, 10, ThFS. Sec. C, 3, ThFS. Sec. D, 4, ThFS. Assistant Professor Griffith, Mr. Gill

S12a. Basketball Theory.—Instruction will be given in basketball with the idea of fitting men to coach. The course will cover passing, goal throwing, dribbling, team play, how to condition a team, and the different styles of play used by the leading coaches. ThFS, 10. (1). Mr. Winters

S12b. Basketball Practise.—The principles discussed in S12a will be practised in the various sections. (½). Sec. A, 8, MTW. Sec. B, 8, ThFS. Sec. C, 10, MTW. Sec. D, 2, MTW. Sec. E, 2, ThFS. Mr. Winters, Mr. Ingwersen, Mr. Bearg

S13a. Football Theory.—The theoretical work will take up the rules from the standpoint of coaching, players, and officials; the several styles of offense and defense with consideration of their special strengths and weaknesses; generalship and strategy; training; conditioning, and player's equipment. MTW, 8-10. (2). Professor Zuppke

S13b. Football Practise.—The practical work will include punting, drop kicking, place kicking, kickoff, and forward passing; tackling dummy and charging sled; special drills for linemen, ends, and backs; following the ball, interference, and team work; fundamental plays, freak plays, and signal systems. Sec. A, 9, ThFS. Sec. B, 4, MTW. Sec. C, 4, ThFS. Sec. D, 5, MTW. Mr. Bearg, Mr. Ingwersen

S14. Training.—Theories of training, massage, treatment of sprains, bruises, etc.; bandaging and first aid. Lectures and practical work. This course should be taken by all who take S10, S11, S12, or S13. (⅔). Sec. A, 1, MT. Sec. B, 1, WTh. Sec. C, 1, FS. Sec. D, 2, WTh. Sec. E, 2, FS. Mr. Bullock

S15. Calisthenics.—(Free Exercises). System, value, method, and progression. Typical lessons for corrective and responsive work. The use of wands, clubs, and dumb-bells. Emphasis to be laid on progression and method of presenting material. The simplest and most explanatory terminology. Theoretical and practical work. (½). Sec. A, 3, MTW. Sec. B, 5, MTW. Mr. Staley

S16. Mass Physical Activities.—Practical participation in and direction of mass games, mass athletics, and combative contests—a coming feature in the American physical training program; also theoretical discussion. (½). ThFS, 3. Mr. Staley

S17. Gymnastics.—Theory and practise in elementary exercises on heavy apparatus; mats horse, horizontal bar, rings, and parallel bars. Accuracy of form and execution emphasized. The chief purpose is to teach a large variety of rapid mass work adapted to the average class. The laws of gymnastic progression. Nomenclature and analysis of exercise. Theory and practise. Sec. A, 2, MTW. Sec. B, 5, MTW. (½). Mr. Wagner

S19. Organization and Administration.—Includes lectures on purposes of physical education, methods, and tests; organization of a department; administration; paper work. ThFS, 11. (1). Assistant Professor Griffith

S21. Gymnastic Dancing.—Theory and Practise. System, progression, and method of presenting gymnastic dance steps for class or individual instruction. Theory, personal proficiency, and practise teaching. (½). Sec. A, 3, MTW. Sec. B, 4, MTW. Mr. Wagner

S22. Theories and Systems of Physical Training.—Lectures on the Swedish, German, and French theories of Physical Training, and on present day Physical Training and athletic sport in Greece, Italy, France, Germany, Sweden and England. MTW, 10. (1). Mr. Staley

S24. Swimming.—Theory and practise. Includes confidence methods, breast stroke, side stroke, crawl stroke, back stroke, diving, water basketball, water polo, and life saving. (⅓). Sec. A, 4, MTW. Sec. B, 4, ThFS. Sec. C, 5, MTW. Sec. D, 5, ThFS. Mr. Brown

PHYSICAL EDUCATION FOR WOMEN

Director Freer, Miss Bussell, Miss Terborgh

S1. Hygiene.—Lectures. Especially arranged for elementary and high school teachers. (4 weeks course). MWF, 11. (½) Miss Freer

S2. Gymnastics.—Formal. TT, 3. Natural. TT, 4. Miss Freer, Miss Bussell

S3. Folk Dancing.—Consisting of simple and more difficult dances. MWF, 2. (½). Miss Freer, Miss Bussell

S4. Basketball.—Instruction, technique, and coaching. MWF, 3, (½). Miss Bussell

S5. Interpretive Dancing.—MWF, 4. (½). Miss Bussell

S6. Games.—Team games of lower organization (volley ball, bat ball, relays, etc.) TT, 2. (¼). Miss Freer

S7. Swimming.—MTWTF. 10, 11, 2, 3, 4. Miss Terborgh

PHYSICS

Professor Watson, Assistant Professor Williams, Mr. Ham, Mr. Sanders, Mr. Jensen

S71. General Physics, Part I.—Lectures with experimental demonstrations and recitations on mechanics, including the fundamental laws of motion, forces and their effects, equilibrium, etc. (For students in Arts and Sciences). Text: Kimball's *College Physics*. MWF, 11; Lecture Room, 100 P. L. (1½). Professor Watson

Prerequisite: Plane geometry and high-school algebra; registration in Physics S8I. Plane trigonometry desired.

Equivalent: S7 (I, II, III) together with S8 (I, II, III) are equivalent to Physics 7a-7b, 8a-8b, or to Physics 9a-9b, 10a-10b for the college year.

S8I. Introductory Laboratory Physics, Part I.—A laboratory course in physical measurements on mechanics, properties of matter, forces, equilibrium, etc., to accompany S7I. Text: Schulz's *Laboratory Manual.* TTS, 8-10; 212 P. L. (1½). Mr. JENSEN

Prerequisite: Registration in Physics S7I
Equivalent: See S7I.

S7II. General Physics, Part II.—Experimental lectures with recitations on electricity and magnetism. Text: Kimball's *College Physics.* TTS, 11; Lecture Room, 119 P. L. (1½). Assistant Professor WILLIAMS

Prerequisite: See S7I.
Equivalent: See S7I.

S8II. Introductory Laboratory Physics, Part II.—Laboratory experiments in electricity and magnetism to accompany S7II. Text: Schultz's *Laboratory Manual.* MWF, 8-10; 212 P. L. (1½). Mr. JENSEN

Prerequisite: Registration in S7II.
Equivalent: See. S7I.

S7III. General Physics, Part III.—Heat, light, and sound. Text: Kimball's *College Physics.* MWF, 10; Lecture Room, 119 P. L. (1½). Mr. HAM

Prerequisite: Same as S7I.
Equivalent: See S7I.

S8III. Introductory Laboratory Physics, Part III.—Laboratory experiments in heat, light, and sound to accompany S7III. Text: Schultz's *Laboratory Manual.* MWF, 1-3; 212 P. L. (1½). Mr. HAM

Prerequisite: Registration in Physics S7III.
Equivalent: See S7I.

S44a. Electrical and Magnetic Measurements.—Accurate measurement of resistance by commutating Wheatstone bridge, the Carey Foster bridge, and the Kelvin double bridge; insulation resistance; aperiodic and ballistic galvanometers; electric current and quantity; electric capacity. Discussions, recitations, and reports. Four 3-hr. laboratory periods, MTTF, 1-4; 112 P. L. (3).

Assistant Professor WILLIAMS, Mr. SANDERS

Prerequisite: A course in general physics and calculus.
Equivalent: This course is the equivalent of the first semester of Physics 44a.

S15. Electricity and Magnetism.—Lectures, recitations, and laboratory. This course is recommended to students who wish a broader and more accurate knowledge of electrical phenomena and theory than that given in the courses on general physics. Text: Brooks and Poyser's *Magnetism and Electricity.* MWF, 11; 108 P. L. (1½). Mr. SANDERS

Prerequisite: A course in general physics.
Equivalent: Physics 15 (in part).

S18. Teachers' Course.—Discussions of text-books, reference books, apparatus and methods of conducting instructional work in physics. Manipulative work with glass and apparatus. Selected topics in advanced general physics. TT, 1-3; 312 P. L. (1). Mr. HAM

Prerequisite: A course in general physics.
Equivalent: Physics 18 (in part).

S21. Recent Advances and Applications in Physics.—Popular lectures, illustrated by experiments, on recent advances and applications of physics. These lectures are open to the public and may be attended by those interested. They are to be given by members of the instructional staff and others. One half hour credit may be obtained by students registering in the course. Brief abstracts of the lectures in addition to an examination of the main facts presented will be required. Th, 6:45-8:00 p. m., Lecture Room, 100 P. L. (½). Professor WATSON and Mr. JENSEN in charge

The subjects and dates follow:

Relativity; Its Physical Explanation. June 22. Associate Professor KUNZ
Relativity; Discussion of Phenomena. June 29. Associate Professor KUNZ
New Electric Phenomena and Their Use in Telegraphy and Radio Signaling. July 6. Assistant Professor TYKOCINER
Wireless Telegraph. July 13. Mr. BROWN
Fatigue of Metals. July 20. Professor MOORE
Theories of Magnetism. July 27. Assistant Professor WILLIAMS
The Tones from Bells. August 3. Professor WATSON

S23. Wave Motion and Applications.—Discussion of simple harmonic motion; the propagation of waves; forced vibrations. Applications in mechanics, sound, light, and electricity. MWF, 9; 208 P. L. (1½). Professor WATSON

Prerequisite: Course in general Physics.

Equivalent: Physics 23 (in part).

S30. Introduction to Theoretical Electricity.—Discussion of selected topics in electrical and magnetic phenomena including magnetism, electrostatics, electrolysis, thermoelectricity, varying currents, electrons, etc. Lectures, recitations, demonstrations. TTS, 9; 208 P. L. (1½). Assistant Professor WILLIAMS

Prerequisite: A course in general physics; calculus desired.

Equivalent: Physics 30 (in part).

Courses for Advanced Undergraduates and Graduates

S31. Special Problems in Advanced Physical Measurements.—Special laboratory problems such as the accurate determination of the coefficient of viscosity of liquids and gases; the elastic constants of metals; the coefficient of self-induction; capacity of a condenser in absolute measure; the pitch of tuning forks; investigation of wave motion; diffraction of sound, etc. Text: Various laboratory manuals. Arrange time. (1, 1½, or 2). Professor WATSON, Assistant Professor WILLIAMS

Courses for Graduates

S131. Investigation of Special Problems.—This course is available for students who are working toward or who have taken their advanced degrees, and consists of individual special problems which will be under the general supervision of one of the professors. The work done should show originality in method, or should contribute new data in experimental investigation. Arrange time. (1, 1½ or 2).

Professor WATSON, Assistant Professor WILLIAMS

S133. Seminar and Thesis.

Prerequisite: Registration in Graduate School. See instructor.

POLITICAL SCIENCE

Professor GARNER

1. The National Government of the United States.—An introductory course in American government. The Federal Constitution, nature of the Federal Union, organization, powers and activities of the federal government, political parties and party methods, citizenship, suffrage, federal finance, regulation of commerce, government of territories and dependencies. Open to students who have thirty hours of University work. MTWTF, 8; 317 L. H. Professor GARNER

2. Elements of International Law.—Nature, sources, and development of the law of nations; sanctions; relation to national law; conventional and customary laws of peace, war and neutrality. Interpretation and application of international law during the World War. Unsettled questions of international law; international organization; the Society of Nations. Open to students of Junior standing and above. MTWTF, 9; 317 L. H. Professor GARNER

S103. Research in Political Science.—For graduate students who wish to investigate special topics. Conferences to be arranged. (½-1 unit). Professor GARNER

PSYCHOLOGY

Professor PHILLIPS, Dr. GRIFFITH, Miss ANDERSON

Courses for Undergraduates

S1. Introduction to Psychology.—The facts and laws of mind. Sensation and image, perception, attention, memory, emotions, action, and thought. Lectures and discussion. MTWTFS, 9; 410 U. H. (3). Professor PHILLIPS, Miss ANDERSON

Prerequisite: Sophomore standing or consent of the instructor.

Equivalent: Psychology 1 (in part).

Courses for Advanced Undergraduates and Graduates

S13. Minor Problems.—Individual investigations in the form of essay or experiment. Some small problem will be offered for investigation in a field in which the student is interested and opportunity will be afforded to gain practise in observing in other researches under way. Hours to be arranged. 507 U. H. (1-2).

Dr. GRIFFITH, Miss ANDERSON

Prerequisite: The equivalent of Psychology 1 and one other course, preferably training in elementary laboratory experiments, or consent of the instructor.

Equivalent: Psychology 13.

S25. Psychology and Athletics.—Designed primarily for students in the Athletic Coaching School. Psychological analysis of the sports; the mind of the athlete; the development and maintenance of morale; individual differences in psychosomatic performance; the nature of play; the maintenance of mental health. Lectures and discussions. MTWT, 2; 410 U. H. (2). Dr. GRIFFITH

Prerequisite: Psychology 1 or the consent of the instructor.

ROMANCE LANGUAGES

Professor CARNAHAN, Associate Professor SOTO, Assistant Professor HAMILTON
Assistant Professor VAN ROOSBROECK, Miss FOLEY, Miss WALTHER,
Miss BREATHWIT, Miss DALLERA, Mr. STORER

A. FRENCH

S1. Elementary Course.—Pronunciation, grammar, reading of easy prose. Revised Fraser & Squair; Smith & Greenleaf, *A French Reader*. Section A, MTWT, 8, 9; 117 L. H. Section A1, MTWT, 8, 9; 320 L. H. Section B, MTWT, 10, 11; 117 L. H. (4). Miss FOLEY, Miss WALTHER, Mr. STORER

Equivalent: French 1a or one year of high-school French.

S2. Modern Prose and Drama.—Rapid reading of modern authors; review of grammar; composition and syntax. MTWTFS, 9; 113 L. H. (3).

Professor CARNAHAN

Note: Students may earn four credits in this course by taking S4 in addition.

Prerequisite: One year of college French or the consent of the instructor.

Equivalent: French 2a (in part).

S4. Grammar and Syntax.—Special attention to the chief difficulties of modern French syntax. TT, 11; 211 L. H. (1).

Assistant Professor VAN ROOSBROECK

Note: See the note under S2.

Prerequisite: One year of college French, or its equivalent, with minimum grade of B.

S7. Intermediate Composition and Conversation.—Study and practise of idiomatic expression in speaking and writing. MTWT, 10; 320 L. H. (2).

Assistant Professor VAN ROOSBROECK

Prerequisite: Two years of college French or the consent of the instructor.

Equivalent: French 7a.

S25. Teachers' Course.—A study of phonetics, grammatical problems, and methods of teaching. MTWT, 8; 113 L. H. (2).

Assistant Professor VAN ROOSBROECK

Equivalent: French 25.

Courses for Graduates

A cycle of four courses dealing with French literature of the seventeenth, eighteenth and nineteenth centuries will be given in four successive summer sessions.

The Armory

A Campus Scene

S126. Special Periods in French Literature.—Lectures and outside reading. MTWT, 10; 216 L. H. (½-1 unit). Professor CARNAHAN

Prerequisite: Graduate standing or the consent of the instructor.

S195. Research Work Including Work in Preparation for Thesis.—(½-1 unit). Hours to be arranged. 216 L. H. Professor CARNAHAN

B. SPANISH

S1. Elementary Course.—Pronunciation, grammar, reading of easy prose. Text: Moreno-Lacalle. *Elementos de español;* Espinosa, *First Spanish Reader.* Section A, MTWT, 8, 9; 211 L. H. Section B, MTWT, 10, 11; 120 L. H. (4).

Miss BREATHWIT, Miss DALLERA

Equivalent: Spanish 1a, or one year of high school Spanish.

S2. Modern Spanish.—Rapid reading; review of grammar; composition. MTWTFS, 10; 114 L. H. (3). Assistant Professor HAMILTON

Prerequisite: One year of college Spanish or the consent of the instructor.

Equivalent: Spanish 2a (in part).

S4. Grammar and Syntax.—Special attention to the chief difficulties of modern Spanish syntax. MTWT, 11; 114 L. H. (2). Associate Professor SOTO

Prerequisite: One year of college Spanish, or its equivalent, with minimum grade of B.

S7. Intermediate Composition and Conversation.—Study and practise of idiomatic expression in speaking and writing. MTWT, 9; 114 L. H. (2). Miss DALLERA

Prerequisite: Two years of college Spanish or the consent of the instructor.

Equivalent: Spanish 7a.

S9. Modern Novel.—Reading of modern authors, collateral reading and reports. MTWT, 10; 211 L. H. (2). Associate Professor SOTO

Prerequisite: Two years of college Spanish or its equivalent.

Courses for Graduates

A cycle of four courses, dealing with Spanish drama and prose of the seventeenth and nineteenth centuries, will be given in four successive summer sessions.

S125. Spanish Drama of the Sixteenth and Seventeenth Centuries.—Lectures and readings. MTWT, 11; 222 L. H. (½-1 unit).

Assistant Professor HAMILTON

Prerequisite: Graduate standing or the consent of the instructor.

S195. Research Work Including Work in Preparation for Thesis.—(½-1 unit). Hours to be arranged. 222 L. H. Assistant Professor HAMILTON

SOCIOLOGY

Professor HAYES and Dr. RATCLIFFE

Courses for Undergraduates

S1. The Principles of Sociology and Their Application to Present Problems.—Text: E. C. Hayes' *Introduction to the Study of Sociology* (Appleton Co.) MTWTFS, 8; 306 L. H. (3). Dr. RATCLIFFE

Prerequisite: Junior standing or equivalent.

Equivalent: Sociology 1.

S7. Social Problems of the Rural Community.—Text: John Phelan, *Readings in Rural Sociology* (Macmillan Co.) TWTF, 9; 306 L. H. (2). Dr. RATCLIFFE

Prerequisite: Junior standing or equivalent.

Equivalent: Sociology 7.

Course for Advanced Undergraduates and Graduates

S2. Social Relations.—Social Suggestion, Sympathetic Radiation, Imitation, Prestige, Accommodation, Assimilation, Competition, Conflict. Text: Park & Burgess, *Introduction to the Science of Sociology* (University of Chicago Press). MTWTF, 3; 306 L. H. (3). Professor HAYES

Prerequisite: Sociology 1 or consent of instructor.

Equivalent: Sociology 2.

Note: Course S2 meets five times a week. Sufficient work will be assigned to entitle the student to 3 hours credit.

Course for Graduates

S126. Educational Sociology.—MTWTF, 2; 306 L. H. (½). Professor HAYES

Prerequisite: Graduate standing or consent of instructor.

Equivalent: Sociology 26.

This is the same course as Education S126.

TRANSPORTATION

Mr. HERRMANN

Courses for Advanced Undergraduates and Graduates

S1. Transportation System of the United States.—Its development and its relation to the public. MTWTFS, 8; 111 Com. (3). Mr. HERRMANN

Prerequisite: Economics 1 or 2 and junior standing.

Equivalent: Transportation 1.

S17. Railway Terminal Management.—Freight and passenger terminals. TWTF, 9; 111 Com. (2). Mr. HERRMANN

Prerequisite: Transportation 7 and 8, or consent of instructor.

Equivalent: Transportation 17.

ZOOLOGY

Assistant Professor VAN CLEAVE, Dr. HIGGINS, and Assistant

Courses for Undergraduates

S1. General Zoology.—Animal biology; principles of structure; function, interrelations, origin, and development of animal life; simpler and best-established generalizations in zoological theory. Recitations and lecture. MTWTF, 1; 229 N. H. Laboratory; MTWTF, 8, 9; 312 N. H. (5 or 4). If for 4 credit hours only, omit Friday classes. Assistant Professor VAN CLEAVE, and Assistant

Equivalent: Zoology 1, if for 5 hours credit.

S2. Vertebrate Zoology and Comparative Anatomy.—Classification of the Chordata; early stages of vertebrate embryology; structure of vertebrate tissues; anatomy of systems of organs considered in respect to their functions, ontogeny, and evolution in the vertebrate series; anatomical studies of types of Chordata. Recitations and lectures. MTWT, 1; 330 N. H. Laboratory, MTWTFS, 10, 11; 330 N. H. (5). Dr. HIGGINS and Assistant

Prerequisite: Zoology 1.

Equivalent: Zoology 2.

S3. Microscopical Technic and Vertebrate Embryology.—Theories and practise of microscopical technic; fixation, staining, imbedding, section cutting and mounting material for use in the course; study of the early stages of vertebrate embryos. Lectures, laboratory and recitations. MTWTFS, 10, 11; 323A N. H. (3). Dr. HIGGINS

Prerequisite: Zoology 1 and 2.

Equivalent: Zoology 3.

Course for Advanced Undergraduates and Graduates

S21. Introduction to Zoological Research.—Morphology, development, and taxonomy of invertebrates (exclusive of insects). Laboratory, assigned reading, and conferences (2 to 5). Hours to be arranged. Assistant Professor VAN CLEAVE

Prerequisite: Senior standing and one year in Zoology.

Course for Graduates

S104. Morphology and Taxonomy of Invertebrates.—Individual problems dealing with the minute anatomy and classification of invertebrates exclusive of insects. (½ to 1 graduate unit.) Hours to be arranged. Assistant Professor VAN CLEAVE

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